AMERICAN DYESTUFF REPORTER

"Circulated Everywhere Dyestuffs Are Used"

Published by Howes Publishing Company, 440 Fourth Avenue, New York

Devoted to the practical application of dyestuffs in all industries; especially to textile chemistry—the science and practice of scouring, bleaching, dyeing and finishing.

Volume XIX | NOVEMBER 24, 1930 | Number 20

The Importance of Azo-Dye-Sulphites in Connection with Bleached and Dyed Wool

An Account of Some New and Interesting Developments Regarding the Reducing Activity of Sodium Bisulphite

By A. J. HALL, B.Sc., F.I.C., F.T.I.

IT IS over forty-five years ago since Spiegel (Ber. 1885, 18, 1479) prepared a number of sulphite compounds of azo dyes by treatment of the dyes with warm aqueous or aqueous-alcoholic solutions of sodium bisulphite, but it is only lately that they have become important, as the result of certain researches of A. T. King, in connection with the bleaching and dyeing of wool materials. The story of these developments is particularly interesting and is very suggestive as regards textile processing in general, whilst it is immediately concerned with the fastness to stoving of dyed wool, the bleaching of raw wool, the stripping of dyed wool materials, and the fastness to light of all kinds of colored wools.

Subsequent to the investigations of Spiegel these azo-sulphite compounds were examined by Voroschtosov (J. Russ. Phys. Chem. Soc., 1911, 43, 771 and 1915, 47, 1669) and he established the fact that it was only azo derivatives of alpha- and beta-naphthols which reacted in this manner. Voroschtosov considered that the sulphurous acid added itself to the naphtholic nucleus in its ketonic form as shown in Fig. A.

These azo sulphites are usually strikingly different in color from the original dyestuffs and as noted by King (J. Soc. Dyers and Col., 1928, 44, 14) the color changes are generally in the same direction as the color changes produced in the fading of dyed wool. Thus, in fading, reds turn to a more orange shade, and the formation of a small amount of a yellower compound in the case of oranges and reds, or of red in the case of blues, will cause an appearance of actual fading. In the formation of azo-sulphites yellow dyes become much paler yellow products; red dyes give orange-yellow; scarlet dyes give yellowish-red; and blue dyes give more reddish products. But attention will be drawn to this point later; the important point at the moment is that under certain optimum conditions an azo-sulphite can be formed readily, whilst under but slightly different conditions it forms only with difficulty or not at all.

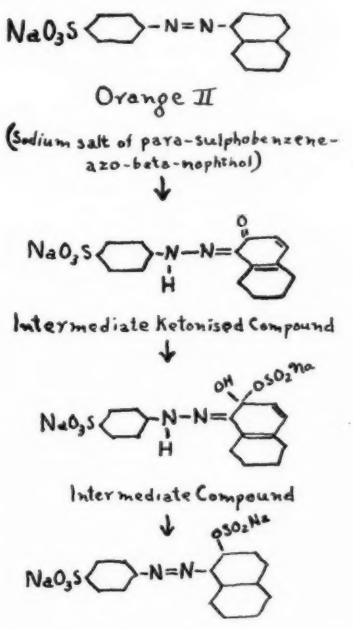
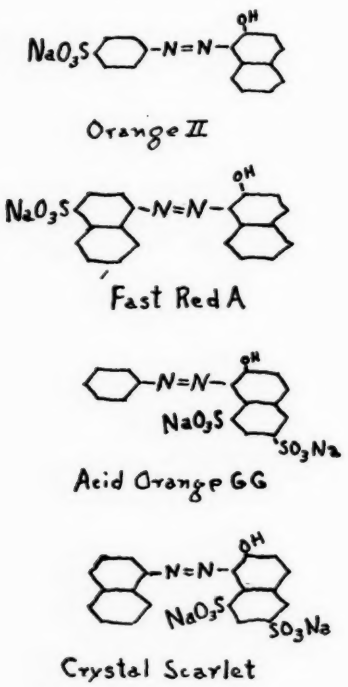


Fig. A

Now in the processing of dyed wool materials, and also in their storage, contact with sulphur dioxide and alkali with formation in the wool of a bisulphite

frequently occurs; if the dyes present are azo compounds derived from alpha- and beta-naphthol then change of shade may occur locally. But it is particularly in connection with stoving that sulphur dioxide is involved. In this process the scoured and moist wool is exposed to sulphur dioxide fumes within a closed chamber for the purpose of bleaching the wool. If the goods contain colored effect threads then these must be fast to the process. Also it sometimes happens that stoved white wool yarns are incorporated in goods containing colored wool yarns; here then is the likelihood of the residual sulphur dioxide in the stoved yarn spreading into the colored yarn and thereby causing a slow change of shade. Finally it must be remembered that wool itself contains sulphur and that on exposure to light and air this sulphur may oxidize to sulphur dioxide. The effect of sulphur dioxide and sulphites on wool dyes, particularly the azo dyes here being considered, is thus of considerable importance. Actually it is important to know accurately the optimum conditions under which such azo-sulphite formation occurs.

King has closely studied (J. Soc. Chem., 1927, 132, 2639) the formation of the azo-sulphite compounds of the wool dyes Fast Red A, Acid Orange GG, Orange II, and Crystal Scarlet which have the following formulae:



King established that these azo-sulphites are stable in acidified solutions of iodine and it is possible, utilizing this fact, to measure the rate of formation of an azo-sulphite in a comparatively simple manner. Firstly the dyes were prepared in a perfectly pure form. These were then added to solutions of sulphurous acid to which were added increasing amounts of caustic soda such that the resulting solutions ranged from sulphur dioxide alone to sodium sulphite. After remaining for two hours at 25° C. the solutions were washed out into acidified iodine solutions and titrated with thiosulphate using starch as an indicator. In this manner the proportion of dye converted into an azo-sulphite derivative for each composition of the sulphite solution was determined. The results for the above four dyes are shown in Fig. 1.

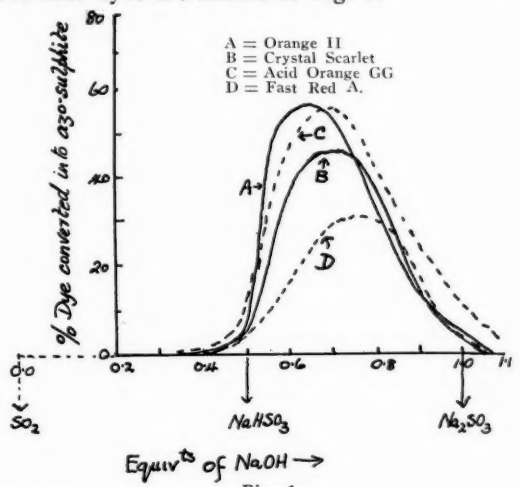


Fig. 1

Consideration of these curves in Fig. 1 shows that with sulphurous acid alone the formation of azo-sulphite is negligible. The proportion of azo-sulphite formed then rises sharply from the point at which SO_2 /NaOH = 1.0 (corresponding to $NaHSO_3$) and reaches a maximum "active range" at SO_2 /NaOH = 1.3. It afterwards diminishes rapidly such that the formation of an azo-sulphite is very small with neutral sodium sulphite; with slightly alkaline sodium sulphite no formation occurs at all. The four dyes behave very similarly though not identically.

As a result of these researches it is concluded that azo-sulphite formation occurs most readily when the dyestuff is in contact with a solution containing sulphur dioxide and caustic soda such that the ratio SO_2 /NaOH = 1.25 — 1.35, corresponding to $2NaHSO_3$, Na_2SO_3. It is now possible to return to the fastness of wool dyes to stoving.

A standard test for determining the fastness of dyes to stoving is carried out thus:

The dyed wool sample is soaked in 2% Marseilles soap solution, then wrung out, and placed in a vessel filled with sulphur dioxide obtained by burning an excess of sulphur. After 12 hours, the wool sample is rinsed well in cold water and dried. According to the change of shade produced the fastness of the dye is classified within five degrees—1 (fast) and 5 (fugitive).

King (J. Soc. Dyers and Col., 1928, 44, 14) then drew attention to the fact, obvious in view of his previous researches, that this test cannot be regarded as accurate. It is evident that the alkalinity of the sample before treatment with sulphur dioxide is not sufficiently controlled; it depends on the pH of the fabric before treatment with the soap solution and also on the amount of soap liquor absorbed by it. This uncertainty will also cause uncertainty as regards the relative proportions of sulphur dioxide and alkali in the fabric during the exposure to sulphur dioxide gas in the test. It is thus evident that in the case of dyes which form azo-sulphites no account is taken of the fact that their sensitivity to change is very much dependent on the ratio of SO_2 /NaOH; the conditions of the sulphur dioxide treatment in the test may or may not (a matter of luck, so to speak) be those favoring rapid azo-sulphite formation. King therefore suggested that the test should be so modified that the sample of wool would be of definite alkalinity before entering the sulphur dioxide and that it should be withdrawn at another suitable degree of acidity, this latter corresponding to the "active range" as indicated above.

In carrying out the test, use is made of Bromothymol Blue as indicator. It has previously been shown by King (J. Soc. Dyers and Col., 1927, 43, 323) that this indicator can be dyed on wool and thus used as an indicator for its degree of acidity. Its color change is blue to yellow over the pH range 6.0-7.6. The test is carried out thus:

Two pieces of wool fabric are employed. One is dyed in the normal manner with the dyestuff whose stoving-fastness is under consideration. At the same time another piece of fabric previously dyed with the indicator—Bromothymol Blue, is treated with an acid bath under the same conditions as in the dyeing of the first piece except that the dye is not present. The two pieces of fabric are then washed together to remove the greater part of the acid retained, and are then treated in a soap solution together until the indicator-dyed fabric (yellow) just changes to greenish-blue; both fabrics are then withdrawn and squeezed free from excess of soap liquor so that they are of the same degree of alkalinity. It is desirable to have for comparison a standard piece of greenish-blue fabric; this assists soaping to the same degree of alkalinity in successive tests.

The dyed pattern of fabric brought to a definite degree of alkalinity as described above is then cut into two pieces; both are then exposed together with the indicator-dyed fabric to sulphur dioxide in a closed vessel as in the usual test. After one or two minutes the indicator-dyed fabric changes to a yellow shade, and at this point it has, together with the dyed pieces, reached the "active range" of conditions. One of the dyed pieces is immediately removed and hung in a moist vessel, whilst the other piece is allowed to remain in the sulphur dioxide vessel. At the end of 12 hours (or any other suitable stoving period) both patterns are examined for change of shade. In this manner the fastness of the dye at the "active range" of bisulphite is obtained and also the fastness under the usual stoving test conditions.

At first sight it may be considered that under the above test conditions the fastness of the dye is measured under two sets of conditions only, but in a subsequent paper dealing more fully with this test (J. Soc. Dyers and Col., 1928, 44, 146) King shows that the fastness is measured over the complete range of conditions up to the active range. This is so since in carrying out the test somewhat long strips of wool fabric are used and when these are hung in the sulphur dioxide chamber the absorption of this steadily decreases upwards; the lower end thus becomes yellow first and if the dyed strip is removed at a time when the lower parts of the indicator-dyed strip are yellow and the upper parts greenish-blue then the fastness of the dye can be observed over this range.

The interest aroused by this new stoving test was increased by the publication of collateral investigations by F. L. Goodall (J. Soc. Dyers and Col., 1928, 44, 145). Feeling that King's test was somewhat laborious Goodall sought to simplify it by the use of spotting solutions. The solutions employed are as follows:

1. 5% Sodium sulphite.
2. 5% Sodium sulphite and 0.4 equivalent of caustic soda.
3. 5% Sodium bisulphite.
4. 5% Sodium bisulphite and 0.5 equivalent of sulphuric acid.

Solution No. 2 represents the active range conditions discovered by King.

In testing, the above solutions are spotted on the dyed material and the change of shade determined after 12 hours. Goodall finds that the results obtained in this manner have never failed to agree with practical experience in the stoving of dyed wool and also with complaints which have from time to time been received in connection with the behavior of dyed wool to sulphur dioxide under various conditions.

It is apparent that the essential difference between the tests of King and Goodall is as regards the actual amount of bisulphite in contact with the dyed fabric; this amount is much greater in the case of the Goodall test. To wet out a spot requires at least an equal weight of solution and 5 per cent of sodium bisulphite is very much greater than the amount likely to be present in wool exposed to sulphur dioxide in practical stoving conditions.

As might be expected the results obtained with these new methods of testing are frequently different

from those obtained hitherto with wool dyes using the older and less exact tests. For the benefit of those dyers directly interested the fastness of the following dyes are tabulated. In Table 1 are dyes formerly reputed to be of good stoving fastness but found unsatisfactory by the new test (Goodall), whilst in Table 2 are to be found those dyes which are fast to the new test but formerly considered to have poor fastness.

TABLE 1

Colour Index No.	Dye	Stoving fastness (old test)
216	Eriochrome Red PEI	5
....	Polar Grey	5
145	Jasmine	5
146	Helianthine G	4
15	Chrysoline	3
151	Orange 2C	4
....	Acid Brown RN	5
27	Acid Orange GG	4—5
1054	Erio Fast Cyanine S conc	4—5
....	Erio Milling Yellow O	5
443	Acid Milling Red G conc	3
487	Acid Milling Red R conc	3
....	Polar Orange GS conc	4
430	Polar Red G conc	3
430	Polar Red GRS conc	3
430	Polar Red RS conc	3
394	Diphenyl Violet BV	5
36	Eriochrome Yellow 2GI	4
36	Eriochrome Yellow O	4
667	Erio Viridine B	4—5

TABLE 2

....	Diphenyl Fast Rubine RL	1
....	Diphenyl Fast Violet C2R	1
....	Diphenyl Fast Violet C4B	2
....	Diphenyl Fast Brown RL	2—3
....	Diphenyl Fast Brown 3GL	2—3
430	Polar Red R conc	3
....	Polar Red Brown V conc	1
....	Erio Fast Brilliant Blue 3R	3

The above dyes are manufactured by Geigy, and the fastness numbers are such that 1 = poor fastness and 5 = excellent fastness.

It appears likely that the fastness of wool dyes to stoving will have to be reconsidered entirely afresh in view of the investigations and results outlined above.

One important point must not be overlooked. That is the effect of the dye's constitution on its behavior to stoving. Already it has been noted that azo-sulphites can be most easily formed from dyes derived from beta-naphthol, and subsequent work has shown that their formation from alpha-naphthol dyes is more difficult. Goodall found that of twenty alpha-naphthol derivatives not one showed any change of shade with his spotting test whilst with all the beta-naphthol derivatives changes were affected. Thus the yellower members of the Polar Red dyes are azo dyes derived from beta-naphthol whilst the bluer members are similar dyes derived from alpha-naphthol; the bluer members are quite unaffected by the stoving test.

The following are further instances quoted by Goodall of the difference between alpha- and beta-naphthol dyes. Erio Phloxene 2GI (Colour Index No. 31; sodium salt of benzene-azo-8-acetylamino-1-naphthol 3:6-disulphonic acid); Erio Azurine B (No. 59; sodium salt of para-dimethylaminobenzene-azo-1:8-dihydroxynaphthalene-4-sulphonic acid) and Eriochrome Black DF (No. 299; sodium salt of 3-carboxy-4-hydroxy-benzene-alpha-naphthalene-azo-alpha-naphthol-4-sulphonic acid) show no change under the test. On the other hand, Acid Orange GG (No. 27; sodium salt of benzene-azo-beta-naphthol-6:8-disulphonic acid); Wool Fast Scarlet G conc. (No. 252; sodium salt of benzene-azo-benzene-azo-beta-naphthol-6:8-disulphonic acid); Eriochrome Green H extra (No. 99; sodium salt of 5-nitro-2-hydroxy-benzene-azo-8-amino-1-naphthol-3:6-disulphonic acid) all show a marked change.

The effect of the alpha-hydroxyl group is also evident in the different behavior of Eriochrome Black A (No. 204) and Eriochrome Black T (No. 203) towards the new stoving test. Both of these dyes are ortho-dihydroxy-azo-colors, but in the case of Eriochrome Black A both the hydroxyl groups are in the beta-position, whilst in the case of Eriochrome Black T, one is in the beta-position and one in the alpha-position. The change of shade under the stoving test is much more marked with Eriochrome Black A than with Eriochrome Black T.

Finally Goodall drew attention to the fact that practically all dyeings of the above sensitive colors are unaffected by the test if previously after-chromed. This would appear to support the theory that in after-chroming, the hydroxyl groups take part in the formation of a chromium color-lake.

In spite of these differences as shown by dyes derived from alpha-and-beta-naphthols it is somewhat uncertain whether or not the position of the hydroxyl groups is of paramount importance. King has investigated this point closely (J. Chem. Soc., 1927, 132, 2641; 1929, 604) and finds that it is rather the substituent groups in the alpha-naphthol nucleus which reduces the activity of alpha-naphthol dyes in azo-sulphite formation. The presence of one or more sulphonic acid groups in a beta-naphthol nucleus assists instead of retards azo-formation whereas the presence of similar groups in an alpha-naphthol dye inhibits this reaction. Thus, whereas alpha-naphthaleneazo-alpha-naphthol-5-sulphonic acid forms an azo-sulphite, the higher sulphonated dyes including alpha-

(*Continued on page 753*)

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OCTOBER MEETING OF THE NEW YORK SECTION

THE October Meeting of the New York Section of the American Association of Textile Chemists and Colorists convened Friday evening, October 24, 1930, at the Alexander Hamilton Hotel, Paterson, New Jersey, Mr. Robert H. Gaede, Chairman of the Section presiding.

. . . Following the routine business of the Section, the program continued as follows:

Chairman Gaede: If there is no further business I should like to introduce the first speaker tonight who is well known to the Association and very well known to the printing industry. Mr. Schey has certainly entertained me a great deal already this evening and I am sure he will do the same for you.

Mr. Robert Schey! (Applause)

The Profession of a Textile Designer

By ROBERT SCHEY

MR. CHAIRMAN, and Gentlemen: It has been my experience in the past in attending banquets that whenever a speaker was introduced by the Chairman with the greatest praise, undeservedly generally, the greatest disappointment was in store for the audience.

I wish to thank Mr. Gaede for his very kind words and I am sure that he will have the same experience as my own.

This is not my first appearance before the Association. About a year and a half ago, I was asked to speak at a Meeting of your Association held in Providence. The speaker preceding me used so many formulas and terms perfectly known to you but unknown to me, that I have been waiting for an opportunity to get even with you, therefore, I am choosing this evening to speak in perfectly plain English, which might be a disappointment to you gentlemen used to high technical addresses.

All of us assembled here are part of the textile industry, either as dyers, color mixers, engravers, printers or designers and altogether form a group of alibis for our customers.

If a piece of printed goods does not sell, generally the designer is called to account, although the design has been selected by the customer, then follows the engraver who points out that he has followed the pattern exactly as drawn. The next person called in is the man from the printing plant, who is asked, "Are those the colors which were sent you?" The answer generally is, "That is the best that can be done." Go back to the designer

because he has given you a beautiful picture which is either not practical or suitable for the fabric.

It is my object tonight to tell you gentlemen more about the profession of a textile designer.

I shall read you a part of Mr. Giles Low's letter to me on the topics allotted to me:—

"I think it would be of much interest if you would touch on the way designs are made to interlock, the avoidance of certain undesirable optical effects, the fashion trends for different kinds of designs and whence come the ideas for them, the problem of meeting the stylist's views, and of rather more importance, the problem of getting printers accurately to match your color combinations."

If I were to follow his instructions in their entirety, I would not only keep you too long but I would perhaps raise a fairly large number of competitors right among you and I might be compelled to close up shop within a year, so I shall touch only the points which I think will be of interest to you without divulging anything which really would be helpful to become a designer.

It is only within the last few years that a designer has been called an artist. Going back over a period of thirty years, a designer was nothing but a peddler—his was not a profession but a nuisance to contend with. We have a repetition at the present moment where peddling is done by a man who imports foreign designs. In the old times there were very few, if any, studios conducted the way they are now or anything like a scientific profession.

It is only since the War that designing has been recognized as a profession by anybody and classified amongst the industrial arts.

Before I try to tell you how and why designs are made practical for the engraver and printer, I wish to state that everybody is at liberty to interrupt me at any time in the course of my impromptu talk. I would rather you interrupt and ask any question not clear to you than to wait until the end when you may have forgotten the point you wished to be informed about.

In the opinion of many people a designer is born and not made—this is not true—neither is it true that there are only good designers on the other side. My own experience is that judging from the nationalities employed in my studio, not quite ten per cent are foreigners, the others are all American boys which proves that we have here in America a great deal more talent than we are given credit for by the public, in general, and particularly in the textile industry.

Going into the technical part, a certain motif is taken and put on a piece of paper, a tracing is made of same and put on a large sheet of paper and this motif is made to look as graceful as possible with a repeat, because, remember gentlemen, a textile designer is constantly working for a machine and that man is the greatest textile artist whose design has the grace and looks of a design thrown naturally on the paper and not forced to fit into the requirements of a machine.

Textiles are printed by rollers in a huge printing machine. These rollers have various circumferences—from 18 to 14 inches.

Before the War, most of the rollers were 18 inches and it was only during the War that we started to use 15 inch circumference rollers to economize on copper.

Whatever the repeat is, the pattern has to fit into either whole or part of the above mentioned repeats. The design has to be so arranged that it will not make a stripe which runs across so as to make the wearer appear short, nor can it make a stripe diagonally across the goods or run parallel with the selvage.

Very frequently these mistakes are made through the arrangement of the colorings.

You see from the technical part alone the difficulty the designer has to overcome to make a design technically perfect, leaving an excellent taste for colors entirely aside.

Every designer must know, first, the several processes by and through which the design is put on cloth. Secondly, he must or should know the fabric on which the design is to be used.

Years and years ago before the War, most of our printing was done in blotch, discharge printing became popular only a short time before the War and has been extensively used since.

There is another problem which confronts the designer and this is the use of commercial or fast colors. On general principles, whenever fast colors are used, black should not touch the colors, in fact, it is a good rule, whenever possible, to leave a white line between the different colors. This problem became very important after fast colors were developed in brighter shades as now.

The first fast colors used (they came in the first year or two before the War) were Indanthrene colors which were dull and mostly used in printing cotton shirtings

I have in my office the first color card issued by Franklin Process and the Glen Lyon Dye Works, which consisted of six shades, and the dullest shades imaginable.

The year afterwards four more colors came out and they too were very, very dull. Still, people adopted them for the simple reason that it gave them something to talk about, that shirtings had perfectly fast colors.

We have developed through the ingenuity of the chemist and with the help of the different institutes, a range of colors which are just as bright as the commercial colors were before. I am speaking principally of cotton.

In silks the fast color problem was only taken hold of two or three years ago. Fast colors in silks have

not as yet reached the enormous use which they have in the cotton trade.

In the last few years another problem was presented to designers. I am referring to rayon and celanese. On account of the many different grades and counts of rayon, many experiments had to be made to determine what processes and what designs would be most suitable for these fabrics.

It would take too long to go into the different experiments which were conducted and the results achieved. It is an established fact now that rayon can be printed in fast colors either by direct or blotch printing.

You ask me to speak about styles. Goethe said, "If you don't feel it, nobody can explain it to you." The same may be said about styling.

Go back over a period of thirty years and you will find the number and character of fabrics used were very small—this has reference to cotton as well as silk. The styling was more or less copied from European sources. Silk foulards and flowered chiffons were the main fabrics. The cutting up trade at this time was practically unknown.

The War changed many things in the Textile industry. It was the first time that this nation was thrown on its own resources in the matter of textiles. I venture to say (I see only two printers present) that in all the history of the textile industry, no country ever made such improvement and advancement in such a short time as America.

It was the most marvelous thing. You can compare swatches in old books which are in my library, (The use of which I offer freely to your organization) with the work which was turned out during the War and you can hardly believe that it is the same America which made those fabrics. This compels me to make a very bold statement to you gentlemen that it has been brought out by clients, as well as my own Paris connection, that Paris is copying us to a large extent. Manchester has been following us for years. Canada is buying our fabrics in spite of the high tariff and the reason for this is, I believe, that we make the most honestly woven and printed designs in the world and where credit has been given to the Mills, the printing and dyeing establishments, none has been given the designer.

It is very natural for the average American merchant visiting Paris to make comparisons between French and American designs and then to draw his own conclusion.

The average American overlooks the fact that Europe has from two to three hundred students, the majority of them only making "Croquettes"—sketches. Any sketch roughly drawn looks considerably more beautiful than a finished design, because there are so many tones in it which are not practical to reproduce on cloth. In addition to this you have "one way" designs, by that I mean, designs where, for instance, in a flower the stem always goes down and the flower always up—not that it gives very graceful lines, but you deal in America with a manufacturer and the manufacturer spreads his goods on the table like that (demonstrating) and turns it over. The moment the pattern knife is used you can readily see he gets the reverse position here, that is, he will get the stem going down in one sleeve and going up in the other (laughter).

I will tell you the reason we demand no up and down designs.

In Europe a dressmaker will go into a silk house and buy only one piece and he can afford that because he gets a very high price for his dress not to be fussy about getting one way patterns. We, in this country, produce dresses at $6.75 to $35.00, which beat any of the dresses that you can find at higher prices on the other side. Why? Because the American cutter as he is called—The American Manufacturer—is ingenious enough to get the best out of the silk manufacturer. He demands the best and he gets it.

Economic Situation: The American silk man under pressure of competition and over-production, tries to get his designs in America as cheaply as he can but on account of the high labor it is impossible for America to compete with Europe on prices. Even here in America there are many poor designers with sketches to sell who know nothing about prices or values; who have to keep their homes going and give their designs for any price they can get.

After a design has been bought, not the best but the cheapest printer is called in. This process holds good in the cotton as well as the silk trade. The great trouble is we have not learned to say "NO" in the textile trade.

I shall tell you of an instance which happened in my studio.

A certain concern opened its own printing plant a few months ago. The concern's representative showed me the first line and said, "What do you think about it?"

Mind you, he bought the pattern from me. I know where he engraved it, and the engraver was excellent.

They were—pardon my expression—rotten.

He said, "What is the matter with them?"

I said, "Look at the colors."

He said, "The colors are very nice."

"But look at that line and that line which they compete with"—the same fabric; there wasn't the excuse of one fabric being better than the other because it was the same fabric.

He said, "I will send the mill superintendent to you."

I said, "Please do."

He sent the mill superintendent. To the mill superintendent I said, "Look at that color and that color. What is the trouble? Look at your red. That is dull and dirty-looking. That is a bright one. Look at your blue."

I said, "Be honest with me. Weren't those bootleg colors?"

We have now an expression "bootleg colors," which are so-called "guaranteed fast colors" with very little fastness because they have been tampered with purposely in order to bring the goods out at a price so that one man can undersell another man by half a cent.

That is a tendency, gentlemen, which I personally would not stand. I might give you gentlemen some advice—and I think I can because I am older than many of you people are. Please do not give in. It will be hard for you in the beginning but you gentlemen can figure, and you know how much the other fellow makes when he gets that business at that price. Let him get it. You will have at least one thing which you can stand on and that is your quality.

To prove that I am sincere when I say that, I might tell you that at my studio they call me "Jesse James without a horse." (Laughter) that is a fact. They call me that because I have one price for everybody, and I let people go out. Mr. Geller knows it and you know it, too, Mr. Wood, don't you?

What I claim is that if you people will improve your colors and your process of producing designs on fabric, it will be easier for you to get a good price than if you try to come down to the lowest copies and go to the cheapest man.

I once heard a very beautiful story.

It was a rainy day. There was a restless boy, a nervous mother, and a grandmother, knitting. The grandmother got up, gave the boy a basket and in the basket were red, blue, green, white and yellow yarns all mixed up. When she handed the basket to the boy, she said, "separate the yarns by color and put them next to each other."

I think we all are doing exactly that in life. We constantly run after everything, see constantly the tangle, never trying to stick to one thing or trying to tackle each problem by itself.

The little boy untangles the yarns. Why? Because he had his eye on all the colors and not on the snarls that were in the basket. He had his eye only on each color.

When it stopped raining the grandmother said to the boy, "Look at the rainbow!"

He answered, "Grandmother, look at my rainbow." He had made a rainbow too.

Thank you, gentlemen. (Applause)

Chairman Gaede: Are there any questions you wish to ask Mr. Schey?

Mr. Wood: I don't think so. I think Mr. Schey has covered the subject thoroughly.

Mr. Steen: Mr. Chairman, I should like to ask a question.

Mr. Schey said that sometimes the colors were not very well matched, the colors that were on the design. Sometimes it will happen that instead of a bright thread you will get a black thread. Isn't that sometimes the fault of the designer himself because of the fact that he doesn't take into consideration that it is awfully hard for the printer sometimes to render one color after the other.

For instance, he has a design made and he makes six combinations. It very often happens that in the first combination the colors he uses are yellow, blue, red and brown, and on the second combination he has to reverse the colors and they go in the opposite way; the third one is different again; the fourth one is different; the fifth and sixth combinations are different.

Mr. Schey: We have been in the habit of taking into consideration the position of the colors. That is to say, we let the light colored paint first and the dark color on top.

In that particular case I mentioned, it was not a question of matching of colors because they were mostly two or three-color designs. The fabric was a percale. I don't know whether you gentlemen know what that is. That is the practice we always follow.

For instance, you gentlemen all know—perhaps those who are not acquainted with printing do not—that flowers are in vogue and that you can't help yourself in a flower. We cannot reverse the colors.

But even in Roman stripes the position of the dark color is kept in all the combinations.

You have brought up something about which I should like to talk a great deal because I think both of us have been at fault. When I say "both of us" I mean the colorist behind the machine and the designer.

We are both working to one end—to make the pattern look as beautiful as possible.

You have certain technical difficulties which we do not have. We have our water colors and you different paints. I should like to suggest to the gentlemen employed in the printing industry as colorists that they give us a list of colors which it is easy for them to reproduce.

You can't have the same colors every year as you readily know. One year monotones are in vogue, the next year contrasting colors are fashionable, but I think we could make your work easier if we could have something like that, not exactly a standard but some idea, for instance, as to what the possibilities are in pastels, what the possibilities are in monotones.

Is that practicable, Mr. Wood?

Mr. Wood: That question involves a great many questions, Mr. Schey.

Mr. Schey: I realize that. The reason I bring it up—I meant to mention it in the course of my talk but forgot to; my friend's question brought it up—is because it is the most difficult question and it is difficult for one reason. I will tell you why.

You may damn us designers as much as you wish; the

fact nevertheless remains that we try to bring new problems constantly to the finisher and printer.

Mr. Wood: You succeed in doing that.

Mr. Schey: I don't think you could pay me a greater compliment because personally I believe that any industry which stands still is going backward. Take for instance the engraving industry. I don't wish to detract from the glory of the speaker who is to follow me and there is no better engraver in the business than he is, and no greater honor could be conferred on me than to ask me to speak at the same time as Mr. McCormack.

I should like to call your attention to one fact. The Craftsmanship which existed twenty or thirty years ago among the engravers and designers doesn't exist any longer. To-day you find very few people who are willing to make a mill, a mill being a little steel cylinder. I tell you what it is only because I imagine that not all the gentlemen present know what it is.

We are coming now to the photographic process. I wish that name had never been invented because it is so misleading to the general public—I am speaking of your customers. This is the idea that prevails generally: that you are painting with twenty-eight, twenty-nine or thirty colors, just as an artist would on an oil painting, and that you can paint anything you wish to; that you have your goods on one side, the camera on this side and the painting in between and that it comes right on the goods. (Laughter)

This is an absolute fact. That is the opinion of the average customer. He does not know that that idea is only in its infancy, and I wish that not a single pattern had been printed until the thing was perfected. Against ten good ones there are doubly poor ones, and just think of the expense of that! That is another thing. We are going to go into the photographic process, but look at the cost. It means that the finisher must invest everything in it and they don't want to pay the price. That is the problem you come up against constantly.

Mr. Wood: To go back for a moment to the sequence of colors, I quite understand Mr. Steen's problem and it is a very difficult problem for this reason; that there are such varying amounts of colors. It isn't only the colors themselves, the hue, and the strength of colors, but there are various amounts of colors. For instance, in one arrangement you might run a very light yellow before a green, which would take care of it quite well, even a small amount of green; but in the next combination you have a blue and there is such a large amount of yellow in the first roller that it still gives you green instead of blue.

Mr. Schey: I grant that. Let me tell you. You can never make rules in art.

Mr. Wood: I will tell you a rule which could be made but I quite understand there would have to be exceptions to it at all times, and that is that the lighest color should always have the smallest proportion on the roll. That would solve it.

Mr. Schey: But there is something we generally do and in many cases it helps the pattern. In textile designing we separate the colors with white.

Mr. Wood: That is a very good plan, especially in the case of discharge work.

Mr. Schey: We separate it with the grounds, in that particular case.

In that connection I might mention a problem which recently came up. Every day new problems come up. That is the reason I love my profession so much.

Picture for yourself a black ground. Do you all know a red polka dot? You know what that means? I wish to make this clear because there are gentlemen present I imagine who don't know anything about printing or figures.

In the red polka dot—never mind the spacing of it—are little white polka dots.

Remember, this is a black ground with a red polka dot and small white polka dots in there.

I showed it to a finisher and he said, "That is practical."

He took it down to the plant. Before he took it down, I knew what was going to happen—I knew he was going to return it. It came back again to put the white in a black outline, separate the red and white, which is a very natural thing to do. Do you see the point?

I am going to show you another thing which might be interesting to you. You take a pink blotch, a blotch being a great mass of color. You know what a pink blotch is. That is a direct print, with a white leaf, for instance, the white leaf is outlined with red. It is monotoned with the ground. You have a pink, with a white leaf and a red outline. The combination is easy, is it not? How is it being done. A totally different engraving is being used than any other engraving. That is not a fitting job. That is an overlapping job, because we let the red outline fall over the pink, to be sure of it fitting. Then your client wishes to have a black background.

Mr. Wood: With the red?

Mr. Schey: No, sir.

Mr. Wood: With the red outline you mean?

Mr. Schey: Yes. You can't do it because your engraving is such—do you see the point?

Mr. Wood: You lose half your red.

Mr. Schey: Nothing has to be done. A separate roll has to be engraved.

Here is an example of how we have to work together constantly, Mr. McCormack and us.

Another point which you gentlemen probably don't know is that your design has to be treated differently for each cloth that is constructed.

Chairman Gaede: Are there any other questions you wish to ask Mr. Schey? If not, I wish to extend our

thanks to Mr. Schey and to tell him that we have learned some of the technicalities of designing.

We are also very fortunate to-night in having Mr. McCormack here to tell us about engraving for the printers.

Mr. William McCormack! (Applause)

Engraving for the Textile Industry

By William McCormack

MR. CHAIRMAN and Gentlemen: Mr. Schey is an artist. An engraver is a necessary evil. (Laughter) There is quite a bridge between us. We can hardly get over on his side of the bridge.

I didn't know but what it might be best to write out a little treatise on engraving and how it is done, etc. It is hardly necessary but it might give you some idea of the problems that we are up against. As Mr. Low says, our problems may be of interest to you.

We receive the rollers from the printer. They are supposed to be of a certain size, circumference, length and so forth, and in many cases they are. Then we receive little swatches of the fabric that it is going to be printed on, and one fabric differs from another, the same as "one bird differeth from another bird," and so forth. Very often, we get a design to engrave that has been purchased from the School of Applied Design in Paris, because the man had had a pretty good time and he left it until the Boss cabled over that they would expect him home on a certain boat. He had to cover himself up, so he bought his designs and they were sent to us—a piece going up this way, lines running across and everything else. They must be right because they are imported. If they are not right when they are put on the cloth, the engraver doesn't know his business.

The engraver asks, "What kind of cloth are you going to print it on?"

He is told, "What difference does that make?"

He engraves the job and sends it to the printer and the telephone rings. A voice on the other end says, "Can you come here right away?"

"Yes."

He goes down and is told, "That work is no good."

"What are you trying to print it on?"

"Come upstairs. I will show you."

And he has a platform longer than this table and on this all these different rolls that are going to be printed from honeycomb towel to chiffon and they must all print exactly alike (Laughter) or the engraver doesn't know his business.

That is what we had to contend with a few years ago. Now we get a sheet and it tells us all of the different fabrics and very often there are little patches of them attached to the design and we endeavor to engrave so that it will handle the color and the cloth in combination and give a creditable result.

The idea is nowadays that everything must be done to-morrow and there is no reason why there should be any delay. We have to take the rollers as they come in, classify them, turn them, polish them, varnish them, prepare them for the Pentograph machines, draw the sketch. If you would like me to I will try to give you an idea of just how we handle that.

As the design comes in it has to be laid out, squared up on the design, and then be increased three times, five times, seven times, nine times as large, and the design is put in a reflex camera which sends it to the zinc, with the same colorings.

If you are going to use certain grades of color on certain rollers, that is, if you are going to use, in your Black, Aniline Black and that is running up against other colors, we have to know that, in order to give you a good set of rollers that will print on the fabric that you want, because the reduction that is made in the size of the solid has to be taken into consideration in order that the colors will not overlap or leave too much margin. If we know that, we can do it. Very often there is a great distance between us and the people for whom we are doing the work and when the work is printed it is discovered that they have used altogether different colors from what we thought they were using. Some colors flush more. Some cloths flush more and, well, we are up against it. We try to do the best we can, but you should hear some of these fellows talk to us. (Laughter)

The engraver as a rule takes pride in seeing a direct reproduction on the cloth of the design that is given to him.

Years ago they used to take time to do engraving and there were some people who rather intimated that there was a little art connected with it. That is all done away with. Now it is all mechanical. Everything is mechanical to-day.

Then they come around and say, "You fellows must do this photographically. Your machines, your ideas, everything, are obsolete. You are out-of-date. You are a dead loss to yourselves."

Some years ago we thought we were getting in advance of things and we put in a full equipment for doing photographic engraving, and we did it beautifully, but couldn't reproduce it. (Laughter) The roller wouldn't last any time at all, even for printing on wall paper. There were only a certain number of rolls that you could get for it, and then you could engrave another roller. That is, the man said you could engrave another roller, but you couldn't.

Now they have overcome those difficulties. There is where the repeat comes in—they can do that to-day and

they do do it, and they do it nicely, and there are a great many photographic prints on the market to-day that give evidence of skill and art, but it isn't practical except for certain characters of design and on certain goods and to be used for certain colors and they don't have lasting qualities.

I said that one time to a group of men, "It is all right, gentlemen, but they don't last." One man said, "Come to our plant. I will show you that they do."

So I went to the plant and he said, "How do you like the looks of that?"

I said, "That is fine. It is a beautiful piece of work."

He said, "Will it last?"

I said, "No."

He said, "All right, come downstairs."

I went down and discovered that he chronium plates his roller and it does last and it gives him all the production that he needs, and for certain lines of work it is beautiful and practical and it is all right, and I say that as an engraver who doesn't do that kind of work.

Mr. Schey said that we haven't any die-cutters to-day. We haven't very many. We have a few, but the dies can be handled by a little different process than the man setting out his pins and laying them out in that way. They can do it by Pentograph and a man of not anywhere near the skill that was required twenty or thirty years ago can trim that up very nicely and produce a very nice effect and it can be done in a great deal shorter period of time than it could be done a few years ago when the man had to sit down and look through his eyeglass all day long, and put a little pin here, a little pin there, and a little cut and produce it in that way.

They get good effects to-day and they get them rapidly and the business is not going to the "bow wows" because a man can do it photographically. And he can do anything. He admits it. But, really, he can't.

We are engravers and we engrave rollers from which they print cloth. We are going to continue to do that because there is a need for it. There is room for the photographic work and there is room for a variety of design, and we do have it. The only thing is that they don't want to give you the time to do it and they don't want to pay for it in proportion to the work that is required to produce it.

A few years ago when everything was overcrowded, they would go over to Paris and buy their designs for printing on fifty-four inch goods. They knew they couldn't get them done because there are not enough engravers in the United States to do it. So they bought their designs in Paris and went over to Manchester and bought their rollers. They got their rollers engraved and sent over here and then they juggled the United States Government on bringing in stuff that is parts of machinery. They got quite a little stuff, but they paid more for it on the other side than they would have in the United States.

A couple of years ago I was in Manchester and I went to a place there where they were doing a little engraving. They had been doing engraving there for one hundred and forty years and they are still using the same buildings and some of the same machinery.

We were looking at some of the work in the machine and the man said to me, "What do you think of it?"

I said, "It is fine."

He said, "What would you be willing to do it for?"

I looked it over and figured it out and gave him an estimate of what it would cost to produce it as we produce it here and he gave me the laugh. He said, "Now we will go up to the office and look over the books."

We went up to the office and looked over the books and found that that man was getting sixty dollars more for doing the job in Manchester, England, than we can get in the United States.

I said, "What do you pay your man? What does that man get and that man?"

He told me. We pay, in the U.S.A. at the very lowest calculation, thirty-three and a third per cent more to have the work done and in the end this fellow gets more for the work than we do.

Is that correct, Mr. Wood?

Mr. Wood: It is about right. (Laughter)

Mr. McCormack: I don't know that there is anything else I can say. If anyone wishes to know something particular in regard to engraving I shall be glad to answer questions.

I might say I like the way they do things on the other side. They help men who are considered geniuses, like some of these fellows who conceived the idea of putting the engraving on the roller photographically. They are men of genius. They are very clever. Very often a man conceives clever methods of doing things but it is almost impossible for him to get the finances that are necessary to further his scheme.

On the other side, as I understand it, if a man has an idea that is creditable and looks as though it is a step in advance, they hold a meeting something like this, only there are not as many people present. The banker, the chemist, the mechanic, the college professor—they all get together and go over this thing thoroughly, and if it meets with approval the banker furnishes the capital and they go ahead and produce it, and the man who conceived the idea is properly reimbursed.

I believe that something of that sort has been introduced in Pittsburgh, hasn't it? But the trouble in this country is that a man may get a good idea but he is afraid of the man who could help him to further that idea and the result is that they don't get together, and then there are thousands and thousands of dollars spent in the production

of certain things that never materialize or come to a head.

I don't know of anything further to say.

Thank you. (Applause)

Chairman Gaede: I don't know if there are any bankers here, Mr. McCormack, outside of Mr. Wood. (Laughter) And I don't know whether there are any mechanics, but I know there are a lot of chemists and a lot of people that are interested in the printing business and I am sure there are some questions that some of them would like to ask.

Mr. Geller: Mr. Chairman, I have a lot of questions that I could ask but they would probably be considered personal questions that I might put to Mr. McCormack or Mr. Schey. Personally, I think they have both given us very clear expositions of their branches of the industry.

Mr. McCormack says that he has learned something: that engraving has to be done so rapidly that he really can't bring out anything worthwhile.

Mr. Schey says that designing has been made very perfect and that the only thing that is necessary is for us to be very careful to bring out the colors better and not to come down on prices. I don't think that is a bad idea, as far as prices go. That is a very good suggestion, but as to the color matching I think Mr. Steen pointed out very well that it wouldn't do them any harm if they would really come down at least every third month to another color mixing shop and buy a pair of overalls—they don't cost much to-day, a dollar and a quarter—and stay for about four or five weeks.

Mr. Schey says he has all his men and girls so that they do understand the situation clearly, what the printer will be confronted with and that they make all these allowances. I don't know.

Personally, I think that the engravers and the designers are coming to the time when they are going to get more business—and that nobody will deny.

Years ago I learned where to buy good designs and that was at Robert Schey's, on the lower end of Manhattan, with his fancy prices, too, and you can rest assured that whatever he charged you is good and proper. If you send him a check for six hundred and deduct seventy-two dollars for **discount you will get the check** back. (Laughter) The only satisfaction I could get when I did that was to hold the check up so I could earn the two per cent, which I had to include in the next check.

I don't know whether Mr. Schey knows this but years ago there was a very good policy among the designers. It was agreed among them that when they sold a design to one converter they would not sell a duplicate of it to another one. Recently I have noticed that some of Mr. Schey's competitors have started a very close search of the designs that they sell and if there is any request for a duplicate they sell it to another customer on the "Q.T."

This is something that happened only a few weeks ago. We delivered a design to a customer on a Friday afternoon and that same evening the truckman got a design from another customer which was identically the same thing. And when we got it the back of the design had the name of the designer but it was so scratched up and so much messed up with some kind of coloring that we couldn't get the name of the designer.

That is something which is absolutely unjust and dishonest. This practice of copying designs has been so open in the last eighteen months that I only pray that Congress will pass a law saying that that is a crime and punishable by the payment of a fine of many thousands of dollars. Something should be done to stop this thievery. But the kind of thievery that is practiced by designers who sell two or three copies of the same design to various customers is something that I haven't heard about until recently.

As to Mr. McCormack's remarks, of course they have a lot of trouble. He has as much trouble as Mr. Schey has. His customer calls him in and tells him about the colors. Naturally, it is the easiest thing for him not to assume the responsibility because there is someone who produces or reproduces the article after the engraving and that is the printer, and you may rest assured that we have a nice time before we get our money.

I don't know whether Mr. Schey knows this but I remember times when we had to turn back designs even to his perfect shop to trace, to repeat, and that was in the days when I wasn't very familiar with what "repeat" meant. I learned what a repeat meant.

But after all you must give Mr. Schey credit. He is even to-day one of the outstanding men in his line, although he is the highest-priced one. We recommend all our customers to Robert Schey. He is a good designer and he makes very good combinations.

Mr. McCormack said—and personally I don't blame him for making these remarks—that in Europe they get more money for their work and they pay less for their labor. That is true. That has been the evil in our trade. When we compare the amount of money we pay printing labor with what they pay in Europe, we find that we are certainly paying a whole lot more here in America. We do not expect the American man to live on the same standard as the European does. However, Mr. McCormack forgot that the man that he saw, who he heard had been in business in Manchester for one hundred and forty years, is in the same position that he has been in for one hundred and forty years, and I think if Mr. McCormack were to go there next summer he would probably find him still working on the same design that he was working on the year he was there. (Laughter)

We live in an entirely different world than the world in which Manchester is located, and where the French de-

signs have been originated. We live in a new world.

I was very happy to hear Mr. Schey say that the idea that you must go to Paris to buy your designs is bunk, and I was very happy to hear him say that out of forty workers he has thirty-six Americans.

Personally, I think we could get anything and everything here in America, for the money, that we expect to get in Paris. The only thing is that when you get something in Paris, it has been made so nicely.

I happened to be in Paris last winter and I had plenty of time to look around. I went around and looked into the windows of the department stores and I can tell you that I didn't see a single printed dress that was classified there as perfect that we would have the nerve to sell here as a second. (Applause)

These are not stories, gentlemen. These are absolute facts.

I walked into the Maison de Blanc and the girl there started to show me some stuff and said, "Oh, this is perfect!"

I thought, Yes, this is perfect. And I tried to get at least a couple of yards of goods so we could trace it, and, believe me, it was a job. The trouble with our men in America is that it has become a habit for the converter to put an ad in "Women's Wear" that John Brown has left for this-and-this-firm to go to Europe to select some of the first designs that come out. And we all run like wild.

Mr. McCormack talked about the good work that they do. As far as engraving is concerned, gentlemen, we see that the engraving machine is not only being duplicated, but I think there are seven times as many Pentograph machines to-day in this vicinity as there were formerly. I don't know what is the situation in places two or three hundred miles from here, but I presume the same thing is true. Mr. McCormack has no kick coming—I am not talking about his financial standing. But he has learned a lot of things, and, believe me, he has learned how to turn out a design in four days where originally it took him three and a half months. (Laughter) And at that time, if you had the nerve to ask his partner, John McLuckie, why it took him so long, before he had time to pull the pipe out of his mouth, you knew what he was going to tell you: "If you don't like it, you can take your engraving somewhere else."

I think that was a good lesson for him to learn: to turn out this work as rapidly as his customers demand.

I don't think I can say very much more. My friend, P. J., can tell you a lot more. I am sorry that he has spent so many years in this game because I see that he is ending up by becoming a banker, and I think that is a better business than the printing business. (Laughter and applause)

Mr. Schey: After listening to the sugar coated pill of Mr. Geller in which he refreshed some part of my talk—it wasn't a speech; I was simply thinking out loud—particularly in view of the fact that I tried to refrain from being personal, and tried to make a perfectly sane, non-aggressive, helpful speech, I feel that I would not be fair to my organization if I did not reply, since in one sentence I have been accused of having sold the same design to several customers, and in another sentence I have been referred to as a shining light among designers here in America. One or the other is wrong.

I am perfectly willing to acknowledge that there are quite a number of people here who are at least as good as I am. I can only plead that I am the oldest designer in America, and when my customers call me, for instance, the man who knows more about textiles than anybody else, they may exaggerate, but nobody has accused me as yet, as Mr. Geller chose to do to-night, of copying designs and then selling a design to one customer and then to another customer.

I don't have to do that. I have plenty of designs left over and plenty of designs in stock now which any customer can have. I don't know anything about the case he refers to and he will have to tell me about that afterwards and give me considerably more information about that.

You were acknowledging before that our work is better than that of the Europeans. Gentlemen, don't be deceived. I am speaking now about the silk trade. Seventy-five per cent of the designs which the printers get to engrave are French designs. And those designs are bought in France for two reasons: One, because they are considerably cheaper; and, two, because so-called stylists go over to Europe and want to have a good time. They could buy here, but they don't.

I didn't wish to go into those matters which would reflect on anybody here. I left them out of my talk purposely.

Designs are bought in Europe without repeats. The repeats have to be made here—absolutely impractical for everybody.

Only last year one particular designer who has made a business of selling designs through importation, who was nothing but a broker—I know the history of this particular man—opened a studio in France, using French designers, and imported from his own studio, where before he had bought designs over here, and this man put designs on the repeat.

It might be interesting to you gentlemen to know that after many years' work—and when I say that, please don't think I am trying to be egotistical, independent, or proud—I am considerably humbler than Mr. Geller. I try to learn every day how to make a living honestly. If I really had the characteristics which Mr. Geller accuses me of, and copied designs and sold the same designs to two, three

or four different customers, you may rest assured I couldn't have lasted in this country longer than a year, clever as I might be.

I helped get the tariff of twenty per cent through, for the benefit of American products. That will not only help textile designers, but will help illustrators at the same time.

I claim that if an industry which used to be one of the biggest which unfortunately through over-production, as it is called, (I would call it "mismanagement") fell down so badly, has to depend on another country, particularly for its art work, that industry isn't worth living.

We have developed an American taste, gentlemen, subconsciously. You don't even know it perhaps but we have nevertheless an American taste, which was described by a French firm in Lyons, and in Paris and by an English house in this way: "Your designs are so fresh." Gentlemen, I think that is the highest tribute that could be paid to us here in America. That means that we have to cut loose from the tradition of the Frenchmen or any European. A prominent French and English artist, known all over the world, happened to be in America at the same time and passed the remark that they could not understand why American art students go to Europe to study when they have better and more material right here.

I mean this seriously, although having been born in Vienna. I have been in this country for thirty-four years, having been a citizen for twenty years. So I would naturally in my thinking take the foreign point of view, you might think. I do nothing of the kind. I have had foreign designers come over here and look at my work and they have been dumbfounded. I have a Viennese merchant come over here and import designs to Europe, and they cost ten times as much as he can get designs for on the other side.

We have developed a taste which is the most remarkable that you can think of, and the taste is in harmony with the habits of the American people.

So far as the other designers are concerned, we have formed a union, about which there has been some publicity, and we have a code of ethics. There are some remarkable statements in that code of ethics, and I am going to send it to your Chairman, also. I would like you to read it so that you may know what we stand for.

That is all I wanted to say in answer to Mr. Geller's remarks.

Mr. Wood: I am afraid Mr. Schey rather misunderstood Mr. Geller's remarks because what he meant to convey was that Mr. Schey's designs had been copied by somebody else.

Mr. Schey: If that is so, I am sorry. I was under the impression that he said I had sold the same designs to two or three people.

Chairman Gaede: No he did not say that.

Mr. Schey: I apologize, Mr. Geller. I got the impression that you had said I sold the same design to somebody else.

So far as you are concerned, Mr. Geller, you might be interested to know that the American Textile Designers Guild of America has contributed (and we are few in number as you very well know how many textile designers there are in America; they can be counted on the fingers of one hand) a considerable sum to the Committee to get the Vestal Bill through. We are more interested in keeping our part of the industry clean perhaps than any other group of men, for one reason: We are ambitious to show the Europeans that we have just as good textile designers as they have on the other side, if the opportunity is given to us. But we hate to have things like this happen, and this happened to me:

A man came back from the other side—think of the nerve; this happened to-day, mind you—with one hundred and fifty designs that he had bought in Europe and he asked me if I wouldn't be good enough to let him look through my collection.

On the other hand, I want to tell you something else. Mr. Geller was right in what he said about the fabrics over there. I was in Europe recently and I went through the department stores. I should like to have you know that I saw there in what is considered the leading dressmakers' shop of Europe a dress for six thousand francs. It was a print, on a fabric which you couldn't sell to Hearn's sub-basement. So full of imperfections was this merchandise in this expensive dress I saw in Paris that as I said, it could not have been sold at Hearn's.

I don't know how long I am going to live. I have served my time in the textile industry. I am not speaking from any selfish motive at all. Nothing is farther from my mind. I make a plea for your support for the younger generation which is coming up.

We are turning out of the textile high schools more designers than this country can ever absorb for the simple reason that they were told during the war what an enormous possibility there was in the textile field. It is a small opportunity on account of the importation of foreign designs. However, there would be an enormous opportunity if the importation of foreign designs could be stopped, not because of the cheapness of designs, but on account of the merit of our designs.

Mr. Wood: There is one thing which hasn't been touched upon here to-night and that is the matter of repeat in the making of designs. Mr. McCormack will appreciate this difficulty which he has sometimes.

If a designer makes a three-round, it takes just three times the amount of work that it does for a four-round, when you can use two bars.

That is one of the things that has troubled all of us at different times and I think it is a point that is very

frequently overlooked: that is, three-round in sixteen inches or fifteen inches, instead of four-round, which would mean two tracings with two bars, with double bars, instead of three tracings with a single bar.

I was very much surprised to find what very smart salesmen the English engravers are as compared with the American engravers. (Laughter)

Chairman Gaede: Are there any further questions? If not, I will ask for a rising vote of thanks to Mr. Schey and Mr. McCormack.

A rising vote of thanks was extended to the speakers of the evening.

The meeting thereupon adjourned at ten o'clock.

ANNUAL MEETING OF THE PIEDMONT SECTION

THE Piedmont Section held its Annual Meeting at the Hotel Charlotte, Charlotte, N. C., October 18th, 1930. The Secretary's and Treasurer's reports were accepted as printed in the announcement for the meeting.

The Nominating Committee, consisting of Malcolm Mackenzie, Chairman, H. A. Barnes and T. R. Johnson, nominated the following officers, who were elected to serve for the coming year:—Samuel L. Hayes, Chairman; John L. Crist, Vice-Chairman; A. R. Thompson, Jr., Secretary; George P. Feindel, Treasurer.

A letter from Mr. Brown Mahon of Greenville, S. C., inviting the Association to hold its Annual Meeting in Greenville during the Textile Exposition every two years, was read and the matter was left in the hands of the Executive Committee for final action.

Mr. Robert Lassiter gave a very forceful address on business conditions in the Textile Industry. The speaker pointed out the various underlying causes of the business depression now affecting the Textile Industry and explained how the various factors, such as installment buying, overproduction, etc., brought on the present condition and he explained the various stages into which the industry must pass in order to operate on a profitable basis. Mr. Lassiter spoke of the abandonment of employing women and children in the Textile Industry at night as a social and economic error and illustrated his point very forcefully. Mr. Lassiter's address was one of the outstanding talks made at the meetings of the Piedmont Section during the past year.

A Paper, "Dyeing of Sulphur Colors," by E. P. Davidson of E. I. duPont de Nemours & Company, Charlotte, N. C., was read.

Mr. Robert Robertson, Hosiery Technician of the National Aniline & Chemical Company, was unable to present his paper on Dyeing and Finishing Hosiery, because of sudden illness, but the paper will be presented at the January Meeting of the Section in Greensboro, N. C.

The Entertainment program was enjoyed by the 140 members and friends present.

Respectfully submitted,

A. R. THOMPSON, JR.,
Secretary.

SIXTY-SEVENTH COUNCIL MEETING

THE Sixty-Seventh Council Meeting of the American Association of Textile Chemists and Colorists was held at the Wool Club, New York, Friday afternoon, October 31, 1930.

The meeting was called to order at 1:30 o'clock with the following present:

President: E. H. Killheffer.
Vice-Pres.: Walter S. Williams.
Councillors: Wm. R. Moorhouse, Hugh Christison, Ralph F. Culver.
Councillors (ex-officio): Prof. L. A. Olney, Chairman, Research Committee; A. H. Gaede, Chairman, New York Section.
Guest: Dr. Jos. F. X. Harold, Chairman, Technical Program for Annual Meeting.
Secretary: Alex. Morrison.

The Secretary's report of the Sixty-Sixth Council Meeting was read and approved.

The Secretary's balance sheet was read as follows, and approved:

Secretary's Balance Sheet—October 30, 1930

Cash on hand 9/25/30	$204.75
Receipts 9/26/30 to 10/30/30 Incl.	
Applications (16 @ $5.00)	80.00
1930 Dues (2 @ $5.00)	10.00
1931 Dues (4 @ $5.00)	20.00
Natl. Asso. Wool Mfr.	500.00
Atlas Electric Devices Co. (Light Reports)	25.00
Year Book Sales (4 @ $3.00)	12.00
Howes Publishing Co. (Reporters)	1.50
	$853.25
Disbursements	
Exchange charge 9/30/30	$ .25
10/28/30 to Treasurer—Research Fund	525.00
10/28/30 to Treasurer—General Fund	100.00
Cash on hand Andover National Bank	228.00
	$853.25

The following were elected to membership as of date thirty days after publication of application if no objection is received from any member:

Active

Booth, Arthur, 135 Clinton Ave., Clifton, N. J. Instructor Textile Chem. and Processes, Paterson Vocational School, Ellison and Summer Sts., Paterson, N. J.

Killheffer, John W., 395 Orient Way, Rutherford, N. J. Directing dyestuff standardization, Newport Chemical Works, Inc., Passaic, N. J.

Kneeland, Dexter R., 373 College St., Lewiston, Me. Supt. of Dyeing, Bleaching and Finishing, Bates Mfg. Co., Lewiston, Maine.

Patton, W. R., 1109 Broad St., Durham, N. C. Dyer, Durham Hosiery Mills, Durham, N. C.

Junior

Allard, Edward J., 116 Ennell St., Lowell, Mass. Student, Lowell Textile Institute, Lowell, Mass.

Gallagher, Arthur F., Wilton, N. H. Chemist, Hillsborough Mills, Wilton, N. H.

Howard, Lorne F., North Chelmsford, Mass. Student, Lowell Textile Institute, Lowell, Mass.

Ivers, Gerald A., Columbus Ave., E. Chelmsford, Mass. Student, Lowell Textile Institute, Lowell, Mass.

McAllister, Gordon A., N. Billerica, Mass., Student, Lowell Textile Institute, Lowell, Mass.

Meinelt, Herbert E., 55 Wesley St., Lawrence, Mass. Student, Lowell Textile Institute, Lowell, Mass.

Orlauski, Anthony, 50 Hillcrest Ave., Haverhill, Mass. Student, Lowell Textile Institute, Lowell, Mass.

Peterson, Eric, 14 Winthrop Ave., Lowell, Mass. Student, Lowell Textile Institute, Lowell, Mass.

Walker, Samuel J., 37 Varney St., Lowell, Mass. Student, Lowell Textile Institute, Lowell, Mass.

The following were reinstated to membership:

Frederick A. Alter
William Stewart

The following were appointed a committee to select the four best papers published in the Proceedings during the past year, the awards to be made at the Annual Meeting:

Walter S. Williams, *Chairman*
Dr. J. F. X. Harold
Daniel P. Knowland
Dr. Walter M. Scott

The agreement between the Association and Howes Publishing Co. which it was voted be drawn at the last meeting was read and the President and Secretary were authorized to sign it and present it to the Howes Publishing Co. for their signatures.

Prof. L. A. Olney referred to the vote at the last Council Meeting granting him $500. for employment of research assistant. He explained that because of certain arrangements the Lowell Textile Institute has to make with part time students, that it would be necessary to have this amount for two years, and requested the vote of the last meeting be changed. It was voted to rescind the vote of the last meeting and to allow Prof. Olney, as Chairman of the Research Committee, for the purpose of employing part time research assistant $500. per year for two years.

It was voted to set aside a page in the 1930 Year Book to the memory of the following members who had died during the past year:

William E. Caffrey
Clarence N. Cone
Robert E. Sargent
Jokichi Takamine, Jr.
J. C. Watson
Dr. Berthold Wuth

A letter from the United States Commission for the celebration of the 200th Anniversary of the Birth of George Washington, suggesting the adoption of a set of resolutions pertinent to the occasion, was laid on the table.

About three hours was spent with Dr. Jos. F. X. Harold, Chairman of the Technical Program Committee, for the Annual Meeting, in discussing and arranging this program.

The meeting adjourned at 4:45 P. M. to meet next in Boston, November 21st, 1930.

Respectfully submitted,
ALEX. MORRISON,
Secretary.

MEETING OF SOUTH CENTRAL SECTION

THE South Central Section of the American Association of Textile Chemists and Colorists held their regular meeting at the Patten Hotel on November 8, 1930.

Immediately after dinner, the meeting was called to order by the Chairman. Due to the confusion incident to a change of secretaries, there were no minutes of the previous meeting.

An interesting paper on "Dyeing Silk Hosiery" was read by Mr. Noel D. White, the vice-chairman. This was made still more interesting and instructive by the introduction of several samples illustrating the points discussed, and the general discussion which followed the reading of the paper.

Plans for the National convention were discussed, and a meeting of all chairmen of committees connected with the arrangements was called immediately after the adjournment of the regular meeting.

The following were appointed by the Chair as a nominating committee for officers for the ensuing year and to report at the next regular meeting of the Section:

H. A. Rogers, *Chairman*
J. A. Kelly — G. H. Dubois
Homer Whelchel — R. C. Staples

There being no further business, the meeting was adjourned.

Respectfully submitted,
J. D. MOSHEIM,
Secretary.

Proceedings of the American Association of Textile Chemists and Colorists

Dyeing Silk Hosiery

By Noel D. White

THE first and most important operation in dyeing silk hosiery is the boil off, or degumming of the silk in the goods. In this operation, the silk is stripped of the sericine, or gum covering, of the silk fiber and the whole fabric is cleaned of the oils, softeners, and lubricants used by throwsters, spinners, and knitters in the course of manufacture.

It has been a much debated question whether the degumming of silk hosiery is best done with soap or boil-off oil, and the question is still open to debate. There are dyers that are sold to the oil method, and it will be hard to convince them that soap is a better degumming agent, and in this talk tonight we will not argue that point except that we will try to bring before you some evidences gained in our experience of many years that both mediums have merits according to local conditions, the kind of fibers in the hosiery, besides the silk itself, and the ability of the dyer to choose what is best for his work.

In a dye house that is equipped with a filtering and water softening system, soap may be used with good results provided enough soap is used and the washing of the boiled off goods is done thoroughly. I said "enough soap is used" because only recently I read in a reputable textile paper an article on boiling off fine silk hosiery, and it was stated to use "10 per cent of soap reckoned on the amount of goods to be processed." Now that statement was wrong. Anyone trying to boil off silk with 10 per cent of soap is sure to get in trouble. To degum silk properly it takes no less than double that amount reckoned on the amount of silk in the goods.

For example: For service weight hosiery where the tops toes and heels are knitted with cotton the hosiery may be 40 per cent, or even 50 per cent, cotton, in which case 10 to 12 pounds of soap would be sufficient to degum 100 pounds of hosiery. On the other hand, if the cotton is only used on the reenforcement of the hosiery, in the seam, or in some plaited parts, it may be only 10 per cent or 15 per cent in 100 pounds of goods, and 10 per cent of soap will positively not be enough to do a good job of degumming. I have had dyers tell me that it took them three hours to boil off a lot, and "How could I do it in 45 minutes?" But, it can be done in less time on fine hosiery with good circulation; it is only a question of using enough soap of the proper kind.

When the dyer has no soft water available, and has to do his work with calcareous water, soap may not be the best thing to degum with. The lime and magnesium in the water will break up the soap before degumming is completed, and more than the stated amount of soap would have to be used to take care of the soap that is lost in the hard water. Here is where a good boil off oil would be by far the best medium together with some modified alkali as an aid to correct in some way the hardness in the water and hasten the process. If the hosiery also contains rayon, then the best way is to boil off in a good grade of boil off oil and to use enough of it to get it done in the shortest possible time. The softeners used in making and knitting rayon are almost impossible to remove with soap, and even though a good boil off may be obtained with it, it is extremely difficult to wash the goods free of "nigger heads" (the name some dyers of hosiery have given to those greasy pellets often found in the finished hosiery.)

Washing the boiled off goods comes next, and must be done thoroughly. If a good soap, or boil off oil has been used this operation will not be very difficult. The first washing may be done at a high temperature. The goods at this time contain a good deal of the boiling off medium, and will wash out a lot easier in a hot water bath at 160°F., or even higher, for at least fifteen minutes, then in a second rinse at 120°F. In this second water, a small amount of a mild alkali would be beneficial in preventing what soap still remains in the goods from breaking up and impregnating the hosiery with grease. About fifteen minutes in this water, and then in a final rinse. There is still a chance in this last water to provide a lot of trouble if it is not done carefully. The temperature here must be watched; about 100°F. is sufficient to remove the remnants of soap and leave the goods sufficiently clean and ready to be dyed. With water that has not been softened it sometimes happens that some grease is seen floating in this water. Flooding this grease over the top of the machine, as it is sometimes advised, is absurd. What is seen flowing out of the machine will do no more damage, but if grease is seen floating in the wash water it is most certainly also floating in the bags with the hosiery, with no possible chance of escape, and that will surely appear when the hosiery is stretched out on the inspection tables. The thing to do when the dyer is watching and sees a thing like that happen, is to emulsify the grease by adding some alkali to the rinsing water and keep on washing a little longer until every pellet has disappeared, and then give the goods a final rinse with lukewarm water. The extra time it takes will be amply repaid in cleaner goods and reduced redyes.

Dyeing

Hosiery may be dyed in the same bath at the same time it is boiled off. There are many dyers doing it, undoubtedly with satisfactory results. I do not advocate that method in dyeing silk or silk and cotton hosiery. With silk, cotton, and rayon hosiery, however, I believe it is better to boil off and dye in one bath. The proportion of silk in this kind of hosiery not being large, the boil off bath does not require a large amount of soap or oil. Eight or ten per cent is about the right quantity; the dyestuff is added, the goods boiled about thirty minutes, and

the required amount of glauber salt entered. When the correct match on the three fibers is obtained, the goods are washed and finished. With a proper selection of dyestuffs, the whole operation of boiling off and dyeing should be performed in about one hour. Pure silk hosiery, and hosiery made up with silk and cotton should be boiled off and washed, then dyed in a separate bath.

After the goods have been boiled off and washed properly, they are hydroextracted and straightened out. That is, they are taken one bag at a time, opened up and disentangled carefully, put back in the bag in which they are to be dyed, and put in the machine. Each bag should contain no more than three dozen pairs of service weight, and four dozen pairs of very fine hosiery. Too many in a bag may be as bad as too few for good and level dyeing.

Selecting the Dyestuffs

Bearing in mind that hosiery has to stand many washings, and sometimes the washing is done with soaps that are far from ideal for washing silk, it is important that dyes used for hosiery dyeing be selected with care for fastness to washing.

Rayon and cotton are dyed with direct colors; this class of dyes being the most appropriate for hosiery dyeing. Most direct dyes are also suitable for silk, and with a judicious selection a few can be chosen that will dye almost a perfect union to match the three fibers. Usually, however, the silk has to be toned with some neutral or acid color to obtain a good match.

With a few well chosen direct colors, and with no more than half a dozen silk dyes all the range of current shades may be dyed, toned, and corrected, if need be. The fewer in number of dyes, the better and easier the work will be. Choosing those colors that have the nearest degree of exhaustion; some direct colors will be absorbed very rapidly, others will take longer time. The slowest to exhaust are the best to use in dyeing hosiery, they have a better chance to penetrate the hard places and dye level shades than their more ambitious brothers.

Some direct dyes are advertised to leave the silk white, or nearly so, but it has been our experience that these very dyes are much better and dye the silk nearly as good as the cotton, if applied in the proper way, as you will be shown presently.

Applying the Dyestuff

As I said before, the hosiery may be dyed in the same bath at the same time it is degummed. With hosiery made up with silk, rayon and cotton we have found that to be the best procedure, the silk in that mixture being the smallest percentage, no great amount of dye is required for the silk and the work is done quicker.

With silk and cotton, however, we have found that there is nothing to be gained by dyeing in the degumming bath. The goods are not improved by it, the colors are not as fast, and the formulas being more erratic, difficult to control, no great amount of time is gained and if the amount of dyestuff necessary to obtain a match is taken into consideration, degumming and dyeing in one bath is not without its faults nor as economical as it is claimed to be.

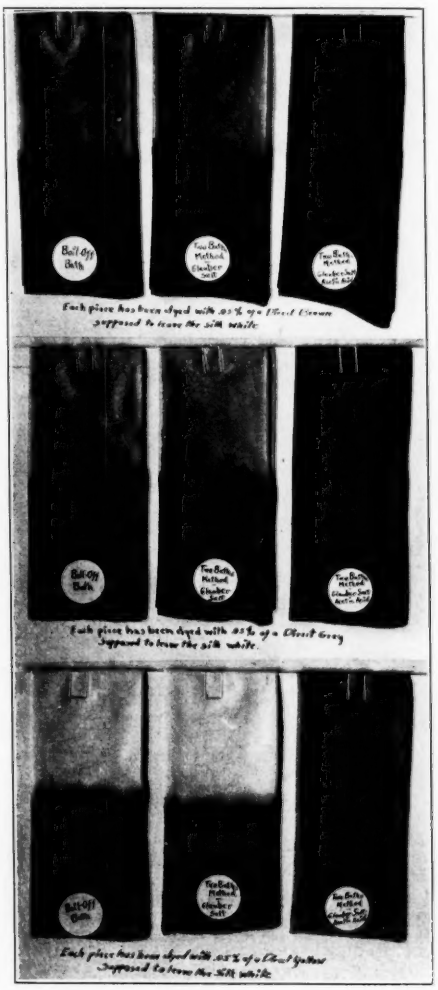

Fig. 1

A number of hosiery dyers use the two baths method. They degum the hosiery, then dye in a clean glauber salt bath, and get results that way. It has always been my contention that method, also, is not as it should be. A glauber salt bath is excellent for dyeing rayon and cotton hosiery, both those fibers exhaust the dyestuff better and easier in a bath slightly alkaline. The affinity of dyestuffs for those fibers is at its best in such a bath, but an alkaline bath reduces the affinity of silk for direct, neutral, and acid dyes and while it may be colored with them it will take much more dye to arrive at a given shade, and

then it is easily washed out of it. It will be found that in hosiery dyed in the degumming bath, as well as in a second bath of glauber salt, the colors are faster on the cotton than on the silk. There may be some exceptions, some dyes that are fairly fast on silk even if applied in an irregular way, the fact remains that direct colors, which are essentially cotton colors, if applied to silk in the proper manner, are much faster than on cotton. Then why not utilize the knowledge of that well known property, and make the silk part of the hosiery absorb as much cotton dye as it is possible to do. When you do that it is easily seen that you will not need much silk dyes to match your fibers to your sample shades, and much faster colors will be the result.

Dyeing Hosiery in an Acid Bath

While we have dyed silk and silk hosiery in every known way, we have adopted the two-baths method, but went a little further and do the dyeing in the second bath with the addition of acetic acid.

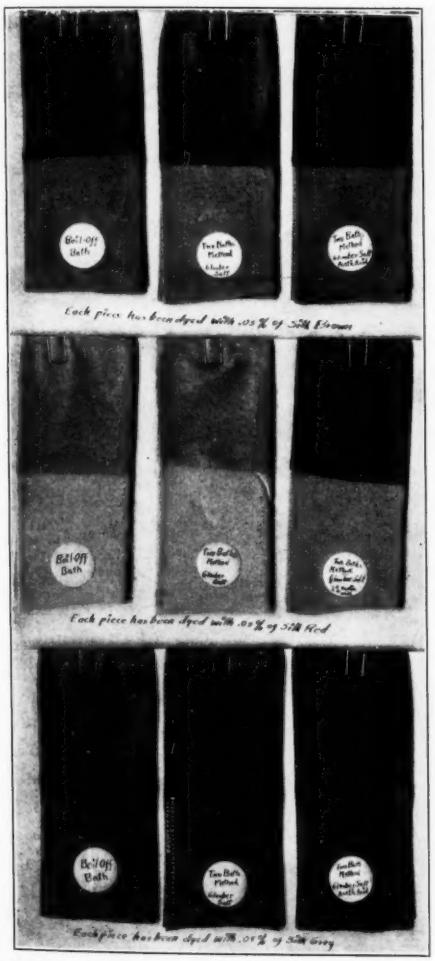

Fig. 2

When it became known among my friends that we were using acetic acid in dyeing hosiery, someone said it was a dangerous proceeding, others said we went a little too far in economizing on dyestuffs, still others wondered how we got by with the hazards of doing work in such an unorthodox way. As a matter of fact, we do not try merely to get by in dyeing hosiery in an acid bath. We do not take any chances; silk hosiery is much too valuable material to be treated in an uncertain, haphazard way, and it is our firm conviction that in dyeing hosiery the way we do it we have the bath under complete control at all times during the processing.

We load our goods in the machine, fill the machine with water, open the steam, and start putting our chemicals and dyestuffs in the following order: turkey red oil, some kind of a penetrant, dyestuffs required, carefully weighed out and dissolved, bring the bath to a boil, and boil for twenty minutes. After this the steam is closed, glauber salt added, and the goods allowed to run in the cooling bath for twenty minutes longer. At this time we add two per cent of acetic acid, bring the bath to a boil again, and sample in fifteen minutes. Sometimes we have to boil a second time to obtain a better union to silk and cotton, very seldom do we have to make any addition of dyestuff, and our matches have to be correct as we consider the reputation of our brand of hosiery had its birth in the dyehouse, and we are very proud of it. After having exposed our methods of dyeing hosiery on several occasions in Textile publications, I have heard many criticisms from some readers who tried to use acid in the bath and reported bad results from it. For my answer to those criticisms, I will tell you as far as I can remember, an old fable many of you may have read or heard.

"The Magpie Builds Her Nest"

The magpie called a meeting for all the birds to be instructed how to build a nest. When they were all gathered, she told them: "You gather some twigs and weave them together in the shape of a bowl." The crow having heard that far, concluded that it was a good way to build a nest, and flew away satisfied that that was the way he would build one.

The magpie, however, had not finished instructions. She went on telling them to gather some dry grass, and cover the twigs with it to make it warm. The swallow having heard that, flew away also thinking he had heard all he wanted to know, and started building his nest that way. Some wise birds listened to the end of what the magpie was telling them, and learned that if they wove their nest with twigs, put some dry grass in the weaving, and lined it with feathers, they would have a nest that was secure, warm, and soft.

And, so it is with most of my critics who have tried our method, and got into trouble. They have some conceptions of their own how the work should be done, fail

to understand what takes place in the progress of the dyeing operation, enter the several chemicals at the wrong time, and when the mischief is done they make up their mind our method is all wet. They don't follow instructions to the end. Like the crow and the swallow, they are satisfied with a hint or two, and follow their own inclinations.

Here is what takes place in the process of dyeing by the method outlined above, told in a language devoid of academic phrases and scientific terms:

When the goods are boiling in the neutral dyeing bath with only the dyestuffs, the turkey red oil and the penetrant, the dye is circulated thru and thru, no actual dyeing takes place except insofar as to be soaked up by the fibers in a loose manner. If it should be desired to continue and finish dyeing in that bath, it could be done but it would require considerable more dyestuff. That is why with some dyestuffs it is suggested to dye light shades without any addition of salt. When, after boiling twenty minutes, glauber salt is added and the steam shut off, the direct dyes are taken up and retained mostly by the vegetable fibers, leaving the silk only slightly colored, unless neutrals or acid dyes are also in the bath. In the cooling bath the cotton gets most of the dye, and after twenty minutes the bath is nearly exhausted and cooled down to about 150°F. at which temperature 2 per cent of acetic acid diluted in about two gallons of water can be safely entered to make the silk absorb the rest of the dyestuffs remaining in the bath.

At this time the bath is acid in reaction, and favorable to dye the silk with what remains of the direct colors in the bath. If from laboratory tests it was found that the direct colors were not sufficient to color the silk to a perfect match, a small amount of silk dyes should have been added to the formula and entered at the start, and after taking a sample, any deficiency in the pattern can be easily and safely corrected now by adding whatever silk color is needed. Boiling the bath again will reduce the color from the cotton and deepen the shade on the silk.

On the other hand, if it be found that the silk has been dyed too deep, an addition of one per cent of phosphate of soda will reduce the acidity of the bath, lighten the shade on the silk, and increase the depth of color on the cotton. In the same manner, if the color on the silk should for some reason be found to be unevenly dyed, boiling the bath with one per cent addition of phosphate will level up the shade very effectively, restoring the shade afterward with a small addition of acetic acid.

Getting Value Out of Dyestuffs

To illustrate to you some of the remarks I made tonight, I have here some test dyeings of three direct dyes and three silk dyes that are mostly used in dyeing hosiery; a yellow, a brown, and a grey, supposed to dye cotton and leave the silk white or slightly tinted.

One is dyed in the boil off bath, and you can see it has left the silk quite undyed. The next was boiled off, washed, and dyed in a clean glauber salt bath, and true to form has left the silk clean. The third has been boiled off, washed, and dyed in a glauber salt bath with the addition of 2 per cent of acetic acid.

Here you can see the gain in color value of the same dye when it is made to yield the full amount of its tinctorial strength. The other two have been processed the same way, and here they are showing what can be done with them. I purposely omitted the name of these dyes because you can do the same, or nearly so, with any direct colors, as you may prove for yourself in your own laboratory when you go back to work next week.

These other dyed samples are of silk colors. They have been applied in the same manner as the direct dyes. These are used to shade the silk when the direct colors do not dye the silk sufficiently to get a good match, and you can see the difference in depth when applied in the right and the wrong way.

Now I want to call your attention to the fact that if the hosiery is dyed with these colors, and made to yield such a depth of shade on the silk, it is quite obvious that very little silk dyes would be needed to bring the match to pattern, and considering that the cotton colors are much faster on the silk than on the cotton, you will agree with me that your hosiery will be dyed much faster colors with acid in the bath than otherwise.

Any further information on this subject you may desire I will be glad to answer the best I know.

MEETING OF PHILADELPHIA SECTION

THE regular October meeting of the Philadelphia Section of the American Association of Textile Chemists and Colorists was held on Friday evening, October 31st, 1930, at the Engineers Club of Philadelphia, 1317 Spruce Street.

The meeting was preceded, as usual, by an informal dinner at the Engineers Club with thirty-one members and guests in attendance.

The meeting proper was called to order by the chairman, Mr. Burt, at 8 P. M. in the Gold Room of the Club. In order to make it possible for the speaker to make train connections, the regular order of business was reversed and Mr. Burt introduced Mr. Percival Wood, vice-president of the American Association of Textile Chemists and Colorists, who spoke upon the general subject of the Association and Sectional activities.

Mr. Burt then introduced our second speaker, Mr. J. H. Thompson of the Hussong-Walker-Davis Co., who addressed the Section on the subject of the Hussong Dyeing Machine. This was followed by a discussion, full text of which is published herewith.

The Section then returned to the regular order of business. Minutes of the previous meeting were read and approved as read. Chairman L. A. Stead reported for the Nominating Committee as follows: for officers and sectional committee for the coming season: Chairman, Mr. Charles A. Seibert; Vice-Chairman, Mr. William Stringfellow; Secretary, Mr. Percival Theel; Treasurer, Mr. Paul A. Endriss; Sectional Committee, Mr. A. M. Burt, Mr. Roy Beauregard, Mr. Eugene C. Knaeble, Mr. Raymond L. Burnett. There being no further nominations from the floor Mr. Bertolet moved nominations be closed; motion seconded and duly passed. New Business: telegram from Dr. E. H. Killheffer with reference to speaker from Philadelphia Section at the Annual Meeting in Chattanooga read and report made that Dr. Carl Z. Draves of the E. I. DuPont de Nemours & Co., would present paper on subject of Wetting Out Agents. Brief remarks by Dr. Rose, our first chairman, who has recently recovered from illness; by Mr. Althouse in reference to Reading meeting and Mr. Smolens in reference to attendance. At the suggstion of Mr. Seibert, it was decided that the policy of having two speakers be followed at each meeting, one on a non-technical subject of interest to our members, and the other on a subject of technical character. There being no further business, motion of adjournment was made, seconded and passed and the meeting broke up in a number of informal group discussions at 10:15 P. M.

There were forty members present.

Respectfully submitted,

PERCIVAL THEEL,
Secretary.

PROSPECTIVE PROGRAM FOR THE ANNUAL MEETING

THE Annual Meeting of the Association to be held at Chattanooga will start Friday afternoon, December 5th, with a meeting of the Council and Research Committees. The local section is arranging for trips of technical interest to nearby plants for the other members of the Association who may have arrived.

In the evening will be the Forum, as usual, starting at about 7 p. m. It will be divided into two portions. The first will consist of a technical symposium on the newer metals employed in the dyebath. The nucleus of this discussion will be a paper by L. J. McGinty and F. L. LaQue entitled "Factors Involved in Single Bath Degumming and Dyeing of Silk Hosiery." It is believed that there will be representatives from the Crucible Steel Company, the Allegheny Steel Corp., and the International Nickel Company, to explain the advantages of the newer Steels in textile practice.

There will then be an intermission (9 p. m.) of about twenty minutes for entertainment by talent provided by the Local Section.

The Forum will then be resumed and the following papers will be presented in abstract and, if time allows, will be read in extenso:

The Delustering of Silk Hosiery by L. S. Zisman of the Gotham Silk Hosiery Co. of New York.

Sodium Phosphate, its Manufacture, and use in the Textile Industry by H. F. Shattuck of the Swann Chemical Company, Birmingham, Ala.

The Process of Silk Soaking by Dr. Foster Dee Snell and Cyril S. Kimball of Brooklyn, N. Y.

Numerical Solubility of Dyes by Walter C. Durfee.

Construction of Celanese Fabrics as Related to Dyeing and Finishing Methods by Harry Price of the Celanese Corporation of America.

On Saturday, the 6th, the Formal Meeting of the Association will take place. The opening paper will be given at

10:00 and will be presented by H. H. Willis, Director of the Textile Department of Clemson College, who will speak on "The Needs for Tests and Research in Textiles."

10:30 B. L. Hathorne of the Tubize Chatillon Corp., will speak on "Mineral Oil Sulphonates Applied to Textiles."

11:00 Paul F. Haddock of A. Klipstein Co., Charlotte, N. C. will speak on "Chemistry Applied to Finishing."

11:30 Dr. Carl Z. Draves of E. I. duPont de Nemours Co., Wilmington, Del., will speak on the "Evaluation of Wetting Out Agents."

12.00 R. W. Marsson of the General Dyestuff Corp., New York, will speak on "The Latest Developments in the Dyeing of Insoluble Azo Colors."

The meeting will then adjourn for lunch to be followed thereafter by the Annual Meeting.

3:00 William H. Cady of Slater Company, Inc., Webster, Mass., will speak on "Abnormal Fading."

3:30 William D. Appel of the Bureau of Standards, will speak on "The Critical Chemist and Colorist."

4:00 Dr. E. W. Pierce of the Ciba Company, New York, will speak on the "Padding of Vat Colors."

4:30 Ira L. Griffin of Stein Hall & Co., Charlotte, N. C., will speak on "Starch in Textile Finishing."

5:00 H. F. Shattuck of the Swann Chemical Co., Birmingham, Ala., will speak on "Sodium Phosphate, its Manufacture and Use in the Textile Industry."

Proceedings of the American Association of Textile Chemists and Colorists

Utility of the Hussong Dyeing Machine

By J. Harry Thompson

Mr. Chairman and Members of the Organization:

I think Mr. Wood was right in stating speeches should be short and snappy and be more or less extemporaneous.

For me to talk to these gentlemen in terms that have to do with the technique of their art would be presumption on my part for the reason they, most of them, know more about our machines than I can ever possibly know, especially as I am neither a chemist or dyer.

The machine to-day is used for the treatment of raw stocks of every description, cotton, wool, worsted, jute, hemp and flax yarns and has been used successfully for the dyeing of ribbon. It is so long since our machines were recommended for and put out for dyeing hosiery that I am not prepared to talk on this subject.

I have been identified with the Hussong machine about twenty years. At the outset machines were limited to 300, 400 and 500 lb. sizes. To-day, the machines are made in any desired size from 1 lb., for laboratory use, to 1,000 lbs. skeins at a time. The small machines for less than 100 lb. lots are styled "Junior machines." Repeat orders for Junior machines are not uncommon. Only to-day in answer to an inquiry regarding the merits of these small machines I had occasion to state a competitor of my correspondent had 17 in use.

We were several years trying to arouse an interest in our Junior machines. Their usefulness can readily be understood when compared with the cost of hand dyeing. For example, two men at 50c per hour, one hour over hand tub with 100 lbs. yarn, cost for labor 1c per pound. A 50 lb. batch in hand tub with the same two men for one hour labor cost would be 2c per pound. One operator will attend four or five of these Junior machines. In our 1,000 lb. machines as much as 1,400 lbs. axminster yarn is dyed at a time.

On discovering that raw stock wool was being dyed in our machines, the stock being thrown in onto the false bottom and forked out, it did not take much ingenuity on our part to design a cage for this work, and later to improve the cage with a detachable top, that, when lifted off, reduced the loading to the simple matter of dumping the stock into the cage. Samples representative of the batch are taken thru a sample door in the top of the cage, and without disturbing the cage, the sample door being flush with the level of the dye liquor.

A battery of 21 of these raw stock machines is in operation in one dye house where they have used them for four or five years since the initial installation. The cages are filled, lifted into the machines, and when the batch is finished the cage is carried over a pit, bottom doors dropped and the batch is deposited onto an apron which conveys the stock thru squeeze rolls, and further automatically into the drying machine. At this plant there are three batteries each consisting of seven machines. The operations are continuous and there is no labor required after the cages are loaded, everything thereafter being done mechanically and much of it automatically.

In dyeing skein yarn a yarn rack is employed. Some of these yarn racks are more than 9 ft. in diameter. Any and all length skeins are dyed in the same racks and the same machine, as a portion of the skeins rests on the false bottom. In our machines tapes and braids made over 109-inch reels are bleached and dyed.

In the matter of dyeing silk and rayon skeins we are doing nothing at this time. The Hussong Dyeing Machine Co. developed a machine for this purpose, tested it in their own experimental dye house and made installations in two or three places, but the dyeings were not satisfactory. Just what we will do in this matter in the future we are not prepared to state at this time.

The dyeing of vat colors has been of much interest to both ourselves and our customers, altho not so much has been done in this direction as in other lines. The cost of stuffing the bath has been against extensive investigation by our customers, but, notwithstanding this, several have used the machines and are using them for this work.

A liquor distributor placed under the false bottom, developed by the Hussong Dyeing Machine Co. has been found a decided improvement in that it divides the flow more evenly thruout the machine. These distributors consist of four ducts which receive the liquor as it leaves the propellers and discharges it in four different sections of the machine.

In conclusion, I might state the business and the entire organization of the Hussong Dyeing Machine Co. were recently moved to Philadelphia, and we invite inquiries and visits from all who may be interested.

I wish to thank Mr. Bertolet, who so kindly asked me to tell you of the merits of our machine.

Chairman Burt: Are there any questions the members would like ask Mr. Thompson?

Question: Can you dye vat colors in the old type Hussong machine?

Mr. Thompson: They are substantially the same. We

have never changed the machine. Originally it was very different from anything on the market. The essential thing in the Hussong machine is proper proportions. The function of the machine is to move a given quantity of liquor in a given time.

Question: Do the ducts run vertically?

Mr. Thompson: No, horizontally under the false bottom. There are four of these ducts in each machine. These ducts open crosswise and receive the circulation as it passes down through the propellers. I might also state there are many of our largest size machines in use. Where sales were at one time limited almost to 100, 300 and 500 lb. machines, the greater part of our sales for the past two or three years have been of the small Junior machines and the 1,000 lb. machines. It might be of interest to you to know we have about 500 machines in use in Philadelphia.

Question: What effect does too much liquor in the machine have on its operation?

Mr. Thompson: In order to answer your question, would state at the outset much experimenting was done with machines of different depths, ranging from 36 inches to 48 inches. Machines 42 inches in depth were found to give the best results with any and all length skeins. In machines 100 lbs. and larger there is a false bottom located 5 inches from the bottom. There is a partition 28 inches high. The level of the liquor carried in the machine should be just sufficient to flow over the top of this partition, which is 9 inches from the top of the tub, and to cover the grid over the yarn rack, or the top of the raw stock cage from end to end.

Question: When dyeing raw stock, in what state should it be placed in the cage—wet or dry?

Mr. Thompson: I would recommend entering it dry, because I believe you will obtain better results. However, some dyers enter it dry while others wet it out in order to fill the cage to its capacity.

Question: Can mercerized yarn be dyed in the Hussong?

Mr. Thompson: Yes, very well.

Question: What is the composition of these machines?

Mr. Thompson: They are made of iron, monel or wood.

Question: Have you tried wetting out hemp and jute before entering into the machine?

Mr. Thompson: No, it would probably pack more if wetted out, therefore making penetration more difficult. If entered dry, these materials are more easily penetrated. Penetration can be improved by speeding up the propellers to, say, 370 rpm.

Question: What is the average running speed of the propellers?

Mr. Thompson: About 360 rpm. for skeins and 380 for raw stock. The difference in speed between skeins and raw stock is not of sufficient importance to talk about. 360 to 370 is a good average speed.

Question: Have you ever run into difficulty in keeping the liquor well circiulated over the entire machine?

Member: Perhaps you have not correctly understood the question. We have run into difficulty with the dyeing at the propeller end.

Mr. Thompson: The Hussong machine will dye as well at the head end when running at 360 rpm. At this speed the liquor is evenly circulated.

Question: Is there any difference in penetration according to the direction the liquor is propelled?

Mr. Thompson: For raw stock run the liquor in one way all the time for best results—from top to bottom of cage. In this we have profited by the experience of others. The machine is so constructed you can readily see at all times just what is taking place, i.e., how the dyeing is progressing.

Question: Have you had any experience with ribbon dyeing with the Hussong?

Mr. Thompson: Yes, our machines have been used for work of this kind, for ribbons of different widths that do not require to be held taut. I understand some ribbons have to be held taut, for such work the Hussong would not be suited.

H. H. Brown & Sons Co., Paterson, N. J., whose work is very diversified have dyed ribbons in their Hussong machines. In them they have also dyed piece-goods with pleasing results. Naturally, to dye piece-goods it would be necessary to hang them in the form of skeins from the poles.

In addition to dyeing ribbons, hemp, jute and other skeins, we have been able to dye in the Hussong machine most anything that can be put in skein form.

Question: Have you done much along the line of hosiery dyeing?

Mr. Thompson: We have dyed sulphur black. Edward Kagermann of this city has had much experience along this line. Personally, I would have to learn more about hosiery dyeing before I would attempt it, or discuss it. I believe Wyconisco Dyeing & Mfg. Co., Wyconisco, Pa., have done much hosiery dyeing in Hussong machine. I believe the old Southwark Mills Co., also used the machine for hosiery dyeing.

IT WILL PAY YOU
TO GO TO THE ANNUAL
MEETING
DECEMBER 5th, 6th

APPLICANTS FOR MEMBERSHIP

Active Membership

Blackman, Morris, colorist, Textile Dyeing Co. of America, Hawthorne, N. J. Sponsors: Henry Boeglin and Alex Morrison.

David, Sydney R., New England manager, Sandoz Chemical Works, 36 Purchase St., Boston, Mass. Sponsors: F. L. McCool and Hugh Christison.

Goldschmidt, O., salesman and colorist, Somerset Aniline Works, Inc., Pluckemin, N. J. Sponsors: Dr. Joseph F. X. Harold and Arthur F. Wiehl.

MacNeill, Elmer S., color matcher, J. & P. Coats, R. C., Inc., Pawtucket, R. I. Sponsors: F. A. Alter and Frederick Mason.

Novak, Edward, dyer, Bellman-Brook Bleachery, Fairview, N. J. Sponsors: Stephen J. Luscian and Carl Toepler.

Tata, A. S. B., dyeing assistant, Empress Mills, Nagpur, C. P., India. Sponsors: Alex Morrison and W. M. Sullivan.

Thompson, Gordon M., chemist, Washington Mills, Lawrence, Mass. Sponsors: Henry D. Grimes and Alex Morrison.

Wille, Karl, textile colorist, Calco Chemical Co., Inc., Bound Brook, N. J. Sponsors: Robert R. Sleeper and W. R. Alvater.

Junior Membership

Cameron, William, laboratory assistant, Pacific Mills, Worsted Department, Lawrence, Mass. Sponsors: L. A. Olney and John N. Dalton.

Grayson, Edward H., dyestuff salesman, Newport Chemical Works, Inc., Greenville, S. C. Sponsors: Dyer S. Moss and N. R. Vieira.

O'Neil, Frank J., laboratory assistant, Pacific Mills, Worsted Division, Lawrence, Mass. Sponsors: L. A. Olney and John N. Dalton.

Treadaway, Randolph, assistant dyer, Wade Manufacturing Co., Wadesboro, N. C. Sponsors: G. S. McCarty and A. Henry Gaede.

MEETING OF THE RHODE ISLAND SECTION

THE October meeting of the Rhode Island Section of the American Association of Textile Chemists and Colorists was held on Friday evening, October 31st, 1930, at the rooms of the Providence Engineering Society.

Mr. G. M. Halberstadt of the Research Department of Procter & Gamble gave an interesting talk entitled "Textile Soaps."

Twenty-five members were present.

Respectfully submitted,

A. NEWTON GRAVES, *Secretary.*

A Hearty Welcome Awaits You
at the
Annual Meeting of the American Association of Textile Chemists and Colorists
Chattanooga, Tennessee
December 5th and 6th, 1930

Headquarters at the Read House

ENTERTAINMENT COMMITTEE:
W. J. KELLY, JR., CHM.
ROBERT D. SLOAN
HOMER WHELCHEL

RECEPTION COMMITTEE:
ROBERT D. SLOAN, CHM.
W. S. McNABB
L. L. OKEY
BEN R. DABBS
W. J. KELLY, JR.
NOEL D. WHITE

SIGHTSEEING COMMITTEE:
R. C. STAPLE, CHM.
A. J. KELLY
ROBERT COWAN
R. M. COVINGTON
H. A. RODGERS
S. H. WILLIAMS
H. H. MORRISON

FINANCE COMMITTEE:
BEN R. DABBS, CHM.
H. A. RODGERS
NOEL D. WHITE

Train Connections

GOING				
Lv. Boston	9:30 A.M.	12:30 P.M.	2:45 P.M.	12:00 P.M.
Ar. New York	3:05 P.M.	5:30 P.M.	8:10 P.M.	6:10 P.M.
Lv. New York	4:50 P.M.	9:05 P.M.	9:05 P.M.	11:10 A.M.
Ar. Chattanooga	5:20 P.M.	8:45 P.M.	8:45 P.M.	9:00 A.M.

RETURNING			
Lv. Chattanooga	6:10 A.M.	11:10 A.M.	5:40 P.M.
Ar. New York	6:40 A.M.	12:30 P.M.	4:48 P.M.
Lv. New York	8:25 A.M.	1:20 P.M.	5:00 P.M.
Ar. Boston	1:55 P.M.	7:00 P.M.	10:00 P.M.

(A prospective program of the meeting is given on page 269 of the Proceedings.)

AMERICAN DYESTUFF REPORTER

Devoted to the use and application of dyestuffs and the mechanical equipment incidental thereto.

LOUIS A. OLNEY
Professor of Chemistry and Dyeing, Lowell Textile Institute
Directing Editor

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Published biweekly by
HOWES PUBLISHING CO., INC.
440 Fourth Avenue, New York City

A. P. HOWES, President — M. D. REESER, Secretary — H. F. CRAWFORD, Treasurer

Subscription price $5.00 per year; Canadian $5.50; foreign $6.00

Vol. XIX November 24, 1930 No. 20

INSTITUTE FOR TEXTILE RESEARCH

WITH the final organization of the United States Institute for Textile Research, the American Association of Textile Chemists and Colorists has something of which to be proud. The A.A.T.C.C. and its off-shoot, the Textile Research Council, are the founders of the new organization. To quote from Secretary Clark's report at the first annual meeting of the new organization: "Were the report of your acting-secretary to cover fully the work that has made possible the first annual meeting of the United States Institute for Textile Research, it would need to start back in 1926 when Textile Research Council commenced to give publicity to the need of such an organization, and would also need to be supplemented by a report covering similar activities of the research committee of the American Association of Textile Chemists and Colorists, which committee started even earlier in actual research work. These two bodies have been the active promoters of the movement that has now advanced to a permanent stage."

This new organization certainly fills a long-felt want in the Textile industry. Certain members of the industry have made commendable strides in the field of research. But,—Does a broken down automobile run any better because a new tire has been put on it? No!—The same is true of the Textile industry. The colorists may put their work in perfect order, but if the rest of the industry is not as well organized, much of the work will go for naught. It is but another example of a chain being no stronger than its weakest link.

No doubt, there will be times when the Institute will want the help of the Association for problems not directly connected with them. It is to be hoped that the Association will then realize the benefits it will derive indirectly, and give its fullest co-operation.

GOVERNMENT TRADE INFORMATION

THE efforts made by the Bureau of Foreign and Domestic Commerce to aid American business to cope successfully with the grave problems which have accompanied the present depression were recently made public by the annual report of W. L. Cooper, Director.

World-wide economic conditions constitute the outstanding factor in the recession of both our foreign and domestic trade, the report discloses, and it is therefore obvious that current developments in foreign markets have a unique significance to American business men at this time. With this in mind, Director Cooper says, his organization expedited the gathering and distribution of facts and figures, increased its cable service abroad, and strengthened all its statistical and informational services. On behalf of our domestic commerce, it rushed to completion many researches which it felt would be of practical value in the present emergency.

Notwithstanding the decline in U. S. export trade, the report reveals that the monetary value of the Bureau's services rose by twenty per cent. The total of $50,000,000 reported, it is explained, includes not only new business developed, but savings accomplished as a result of the Bureau's activities.

In addition to the direct trade promotional work, the Bureau performs a large and increasing number of intangible services, such as providing up-to-date minute information on specific markets; assistance in adjusting commercial misunderstandings; explaining foreign tariff classifications; aiding in foreign trade mark registration; advising of financial standing of foreign buyers, and other services whose nature precludes even an estimate of their value.

During the past fiscal year, the Bureau was represented by fifty-six offices maintained in the principal trade centers of the world. In order to quickly disseminate the information gathered by these trade outposts, as well as to aid the business man in his various domestic problems, branch offices are located in all the large cities of this country. That business men are taking advantage of the services offered by these trade "service stations" is shown by the fact that during the past year they were visited by 150,000 persons.

Although the promotion of our export trade continues to be the Bureau's most important activity, it is turning its attention in a steadily increasing degree to the problems of domestic commerce. In the past year it has achieved distinct success in its work of isolating and treating the individual sources of marketing waste which in the aggregate are costing the country ten billion dollars annually. These wastes are due to a multitude of causes, and the Bureau has found many of them, and in co-operation with industry, has worked out formulae for their reduction on a practical scale.

The operations of the domestic commerce division to eliminate waste have a double function: To find the causes of waste and to assist American business in removing them as they are found.

Practically every American industry in every section of the country is now calling on the Bureau for assistance with those problems which influence economic distribution. The majority of these requests represent problems which business men themselves are unable to solve either individually or through their trade associations.

EXTRACTORIALS

The plant which inaugurates and maintains a system of obtaining production data, will find that production will be stepped up.—*Starchroom Laundry Journal.*

Imagination is our heritage from boyhood. It will stay with every man who does not throttle it. And it will renew the youth of all who use it. Every one of us in business, in commerce and in industry, should foster and indulge every vestige of our imagination. For imagination begets progress. All we have in the way of comforts and conveniences is the product of imagination. Before the steam engine, the electric motor, the railway train, the steamship, the airplane became realities, someone had to see them in his mind—to imagine them.—*Nat'l Laundry Journal.*

Now and then we find an industry which, very much against its preference, has been compelled, because of economic conditions, to reduce its technical staff. We have been impressed with the attitude of some of these concerns. They have parted with men who have been carefully selected and trained with the same reluctance as they would give up any treasure. They realize that in these men they have no small investment. It has cost time and effort to bring them to their present state of efficiency, and to lose them is not only to sacrifice all this but in many cases to lose men who have endeared themselves to the management because of what they have done and because of their personalities. It is gratifying, therefore, though not surprising, to find the personnel managers of some of these organizations doing their utmost to find proper places for these men. It is not customary to take such pains unless one has a sound appreciation of the men, of their accomplishments, and of their potentialities.—*Industrial and Engineering Chem.*

To accelerate chemical reactions in the laboratory, the two great available agencies are pressure and temperature. But to direct and control these effectively on a profitable, industrial scale has called for an entirely new technology — one with which the chemical engineer is intimately concerned. High pressures and temperatures have been made useful tools of industry largely through the solution of practical problems of engineering materials and the design and construction of equipment. Although obviously only on the threshold of its ultimate development, the new technology has become the miracle worker of chemical industry.—*Chemical and Metallurgical Engineering.*

First Annual Meeting of U. S. Institute for Textile Research

Dr. Stratton Elected President

THE annual meeting of members of the U. S. Institute for Textile Research, held at the Murray Hill Hotel, New York City, Thursday, November 6, for permanent organization was preceded by a meeting of the preliminary directors, of whom 15 were present, for the election of new members. Secretary C. H. Clark reported that, as of this date and hour, the Institute had a total of 53 members. He also reported the application of the Botany Consolidated Mills, Inc., represented by H. V. R. Scheel, vice-president, for contributing membership and the following applications for annual membership: Malcolm D. Whitman, president, Nashawena Mills, New Bedford, Mass.; Dr. Joseph F. X. Harold, New York City; Douglas G. Woolf, editor, Textile World, New York City; A. P. Howes, president, Howes Publishing Co., New York City; Prof. E. R. Schwarz, Mass. Institute of Technology, Cambridge, Mass. and Charles L. Simon, Industrial By-Products & Research Corp., Philadelphia, Pa. On motion duly made and seconded these applicants were unanimously elected as a group.

There being no further business the meeting was declared adjourned and the annual meeting of members was convened, Secretary Clark reporting an attendance 24 qualified members.

A report of the committee on by-laws being called for, its report of tentative by-laws, adopted unanimously by the preliminary board of directors July 29, 1930, was presented in printed form by Dr. E. H. Killheffer, chairman, the other members of the committee being P. J. Wood and C. H. Clark. Dr. Killheffer stated that, not only had the by-laws as printed been adopted unanimously by the directors July 29, but that since then they had been carefully scrutinized by the executive committee and he moved that verbal reading by article and section should be dispensed with, and only those sections be acted upon separately that were declared by the executive committee to require revision; the motion was seconded by Douglas G. Woolf and after further discussion was carried unanimously.

Upon motion of Dr. E. H. Killheffer, seconded by Thomas T. Clark, it was voted unanimously that paragraph (d), Section 1 of Article VI be amended to read as follows: "A quorum at any meeting of members of this corporation shall consist of not less than twenty (20) members present in person."

Upon motion of Dr. E. H. Killheffer, seconded by Prof. George G. Haven, it was voted unanimously that paragraph (e), Section 1, Article VI be amended to read as follows: "Voting Power of Members. Each membership of this corporation shall be entitled to one vote."

On motion of W. C. Taylor, seconded by Thomas T. Clark, and adopted unanimously, Section 2 of Article VIII was amended to read as follows: "Fiscal Year. The fiscal year of the corporation shall begin on October 1 and shall end on September 30 of each year."

No further amendments being offered it was moved by Ernest N. Hood and seconded by M. D. Whitman that the by-laws as printed and amended be adopted, which motion being put by Pres. Wood was carried by unanimous vote of the 24 qualified memberships present.

It was then voted unanimously that the by-laws committee be discharged with thanks for their commendable work. Dr. E. H. Killheffer reported that the members of the by-laws committee continued as a committee on incorporation, but that he regretted inability to report completion of legal transfer of the incorporation certificate under New York membership corporation laws of Textile Research Council, Inc., to U. S. Institute for Textile Research, owing to the fact that certain proposed revisions of the original certificate had been turned down by the New York Supreme Court as being illegal for membership corporations, but that with these amendments removed it will be only a short time before the transfer of incorporation certificate would be completed.

Prof. Louis A. Olney moved that a committee of three on nomination of new directors be appointed by the chair, and, this being seconded by Dr. Harold, it was carried unanimously. Acting President Wood appointed as this committee Dr. E. H. Killheffer, Thomas T. Clark, and W. C. Taylor.

Before the nominating committee retired for action, Dr. Killheffer reported as treasurer of preliminary board of directors that, actual receipts to date of approximately $600 from annual and contributing membership dues approximately balanced bills payable to date, but that, owing to the fact that election of a large block of new members had necessarily been delayed until the meeting of the executive committee November 5, and also because certain outstanding bills had not yet been received, he moved that the treasurer's report be submitted later to the new board of directors or executive committee and that his present report be filed; being duly seconded the motion was carried unanimously.

The following reports were read by acting-secretary C. H. Clark: meeting of preliminary directors July 29, report of executive committee and report of acting-secretary. Dr. Warren E. Emley also read a brief report as chairman of the research committee.

Dr. Killheffer then reported as chairman of the nominating committee and placed in nomination the following list of directors:

Class I, serving for one year: Charles B. Nichols, Dr. W. F. Edwards, Walter C. Taylor, Allen R. Mitchell, Jr., P. J. Wood, Philip A. Johnson, H. V. R. Scheel, Dr. E. H. Killheffer.

Class II, serving for two years: James T. Broadbent, Ernest N. Hood, Weston Howland, B. E. Geer, W. Scott Libbey, E. A. Clements, Alban Eaverson, Prof. Louis A. Olney.

Class III, serving for three years: Albert F. Bemis, C. W. Causey, Albert R. Pierce, Thomas T. Clark, W. Robert Blum, D. F. Edwards, H. R. Fitzgerald, Dr. Samuel W. Stratton.

Then followed a brief intermission, to give the new board of directors time to prepare to submit report of nominations of officers and executive committee.

Meeting of Permanent Board of Directors

Upon motion of C. H. Clark which was properly seconded, P. J. Wood was elected temporary chairman for the meeting of the new board of directors. Dr. E. H. Killheffer stated that the executive committee and officers of the preliminary body had fully realized their responsibilities in the selection of the administrative head of the Institute. They had proceeded upon the assumption that it would be best during the initial years of the organization to have as its head a man who not only had all of the necessary scientific and business qualifications, but one who had no direct connection with the textile industry, and thus would be immune to charges of sectional or inter-industry bias and jealousies. He believed they are to be congratulated in having prevailed upon a man having such outstanding qualifications for this responsibility as Dr. Samuel W. Stratton, former president of Massachusetts Institute of Technology and former director of the Bureau of Standards, to accept election as President. (applause) After giving a brief biography of Dr. Stratton, Dr. Killheffer formally moved his election as president of the Institute. Prof. George B. Haven, who had been associated with Dr. Stratton for many years at M. I. T., seconded the nomination after noting his many accomplishments at and during his term of office as president of M. I. T. Dr. W. E. Emley, who was associated with Dr. Stratton during the greater part of the latter's long directorship of the Bureau of Standards, eulogized his work at the Bureau and also prior to and following that connection. It was then formally moved and seconded that nominations be closed and Dr. Samuel W. Stratton was duly elected unanimously by the memberships present as president of U. S. Institute for Textile Research.

Dr. Killheffer, reporting as chairman of the nominating committee, stated that this committee had been given the benefit of the advice of the executive committee of the preliminary organization in its selection of both vice-presidents and executive committee of the permanent body, and that the nominations of vice-presidents were not only intended to provide adequate representation for most of the important branches of the industry but also for its various geographical sections. He then moved the nomination of the following vice-presidents: H. R. Fitzgerald, Thomas T. Clark, Albert F. Bemis, E. A. Clements, W. R. Blum and H. V. R. Scheel. It was then moved and seconded that nominations for vice-presidents

be closed and it was so voted unanimously by those memberships present.

Dr. Killheffer stated that for treasurer of the Institute he would place in nomination a man who is treasurer of his own company, Ernest N. Hood, treasurer of Pequot Mills, Salem, Mass. Having been moved and seconded that nominations be closed, the motion was carried unanimously.

Dr. Killheffer stated that he believed that the acting secretary had practically elected himself by his work for the preliminary organization and moved the appointment of Charles H. Clark by the temporary chairman; the motion having been duly seconded and unanimously voted, Chairman Wood announced the appointment of Mr. Clark as Secretary.

Dr. Killheffer then reported the following nominations for executive committee: H. V. R. Scheel, Ernest N. Hood, Thomas T. Clark, C. W. Causey, Dr. E. H. Killheffer, and E. H. Clements. There being no other nominations it was moved and seconded that the nominations be closed, which motion was carried unanimously by the memberships present and temporary-chairman Wood announced the election of the executive committee as nominated.

After the preliminary board of directors and executive committee had been given a vote of thanks the meeting adjourned until after luncheon.

Thursday Afternoon Session of Directors

The afternoon session of the board of directors was convened at 2 p. m. with vice-president H. V. R. Scheel in the chair. Chairman Scheel then introduced the new president, Dr. Samuel W. Stratton, and the latter was greeted with hearty applause as he took the chair, and also following a brief and informal speech of acceptance.

Upon the motion of C. W. Causey, seconded by Thomas T. Clark, it was voted unanimously that the president appoint a research committee of 24 members. President Stratton announced that for the present he would appoint only eight members, leaving the remainder of the committee to be filled after he had an opportunity to study the needs of the organization more carefully. That part of the committee as appointed by the president is as follows: Dr. W. E. Emley, Dr. W. F. Edwards, Prof. George B. Haven, Prof. Louis A. Olney, Dr. George H. Johnson, W. C. Taylor, A. R. Pierce, and Edwin W. McGowan.

Secretary Clark then announced the application of the A. M. Tenney Associates, New York City, represented by A. M. Tenney, for annual membership and moved election, which, being duly seconded, was carried unanimously.

President Stratton then announced that a motion to adjourn was in order with the understanding that the executive committee and research committee would both hold meetings immediately following, and on motion duly made and seconded the meeting of the board of directors was adjourned, subject to the call of the president.

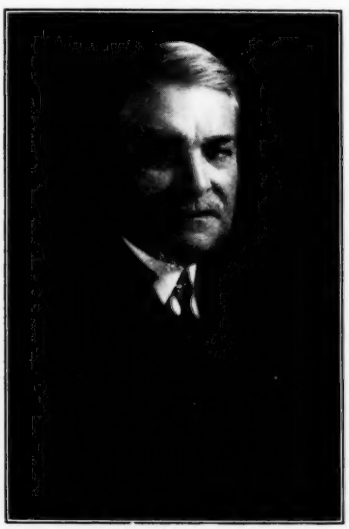
The Research Committee Organizes

The research committee organized with Dr. W. E. Emley as chairman and E. W. McGowan as secretary. In the latter's absence, Mr. Whitcomb of Henry L. Scott & Co., Providence, R. I. was appointed temporary secretary. The research committee spent the greater part of the afternoon in discussion of a list of research subjects and in considering applications for qualifications as participating laboratories, but both matters were left open for consideration at a meeting to be called in the near future.

The afternoon meeting of the executive committee was devoted to routine business matters and this committee also is planning to meet within the next week or two for conference with President Stratton.

SUMMARY OF DR. STRATTON'S CAREER

DR. SAMUEL WESLEY STRATTON, since June, 1930, Chairman of the Corporation and Executive Committee of the Massachusetts Institute of Technology, and for eight years previous to this President of the Institute, is known to the scientific and engineering public as Director of the Bureau of Standards in Washington, D. C., which position he held continuously from 1901 to 1923, when he accepted the presidency of the Massachusetts Institute of Technology.



Technology Portrait Studio.

Dr. Stratton was born in Litchfield, Illinois, July 18, 1861, and took his B.S. degree in Mechanical Engineering at the University of Illinois in 1884.

Following his graduation he remained as a teacher in the University of Illinois until 1892.

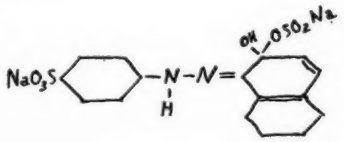
In 1892 he transferred to the University of Chicago where he occupied successively the positions of Assistant Professor, Associate Professor and Professor of Physics, remaining until called to Washington as Director of the Bureau of Standards.

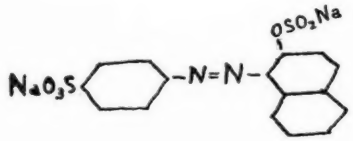
Importance of Azo-Dye-Sulphites

(*Continued from page 728*)

naphthaleneazo-alpha-naphthol-4:8-disulphonic acid (Azo Bordeaux), alpha-naphthaleneazo-alpha-naphthol-3:6-disulphonic acid (Benzyl Bordeaux), and 4-sulpho-alpha-naphthaleneazo-alpha-naphthol - 5 - sulphonic acid (Fast Red VR) do not. On the other hand, Scarlet 6R (a beta-naphthol dye containing sulpho groups in the 3:6:8 positions) is very reactive as regards azo-sulphite formation.

As a result of these later investigations it is also considered probable that the constitution of the azo sulphite is:





That is, water is not finally eliminated from the sulphite compound as previously indicated in this article where the scheme of Voroschtosov is discussed.

It may also be noted that a number of azo wool dyes are actually split up into constituents of smaller molecular weight by the stoving process; an example of these is Fast Acid Blue RH which is the sodium salt of 3:6-disulpho-8-hydroxy-alpha-naphthaleneazo-alpha-naphthyl-phenylamine-8-sulphonic acid. This particular dye turns to yellow on stoving and by no means can the original dye be restored. Information concerning these dyes can be obtained by reference to some interesting investigations by Engel (J. Amer. Chem. Soc., 1929, 51, 2986, 3483). But it is interesting to note the curious reactivity curve of this dye towards sulphur dioxide as determined by King (J. Chem. Soc., 1927, 132, 2643) and shown in Fig. 2; it is quite different from the curve of Orange II and those in Fig. 1.

The sulphur content of wool is important in many directions; it influences the spinning and weaving properties of wool and is concerned with its dyeing behavior. During exposure of wool goods to light part of this sulphur is converted into sulphuric acid (of Bergen; Textilber, 1925, 6, 745), and Meunier and Rey (Compt. rend., 1926, 183, 596), and it is reasonable to suppose that at some stage in this oxidation sulphur dioxide is formed. It is difficult to obtain exact proof of such formation of sulphur dioxide by the methods hitherto used, and for this reason King (J. Soc. Dyers and Col., 1928, 44, 233) formed the opinion that detection would be possible by means of the azo-sulphite formation described above. This surmise proved to be correct.

These azo sulphites are stable to dilute mineral acids and this fact is here very useful. Patterns of scoured wool fabric were exposed for 40 hours in a Fadeometer and then padded with slightly alkaline solutions of Orange II and Crystal Scarlet (dyes which readily form azo-sulphites); the fabrics were then allowed to stand overnight. It is obvious that if sulphur dioxide was present in the wool as a result of the light exposure that this would combine with

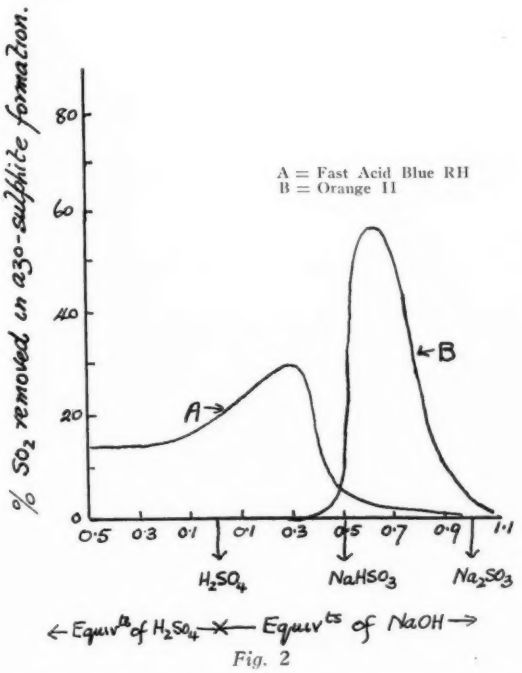


Fig. 2

the alkali to form bisulphite, and in turn this would react with the dyes to form azo-sulphite derivatives. The fabrics were then immersed in a boiling slightly acid bath whereby the dyes were fixed on the fabric. On examination it was observed that in the exposed parts the color was yellower for Orange II and more orange for Crystal Scarlet; these changes may be rightly assumed to be proof of the presence of the azo-sulphites of the dyes, but further proof was obtained by treating the fabrics with ammonia gas when the exposed portions gained their normal color (ammonia and similar alkalis readily decompose azo-sulphites with resulting formation of the original dye). Thus was proved the formation of sulphur dioxide during the exposure of wool to light.

Further investigations showed that the azo-sulphite derivatives of the beta-naphthol dyes—Crystal Scarlet, Orange II, Fast Red A, and Acid Orange GG—were less fast to light on wool than the parent dyes. This is a fact of considerable importance since by various circumstances in a dyehouse it is possible for dyed wool materials to become non-uniformly contaminated with sulphur dioxide. Such materials would show uneven and unsatisfactory fastness during exposure to light in normal use if the dyes present were of the type capable of forming azo-sulphites.

An interesting fact emerging from these experiments concerning the fastness to light of azo-sulphites is that during the fading of an azo-sulphite there is no tendency for the azo-sulphite to decompose into the parent dye and bisulphite; it is the azo-sulphite itself which fades as such.

The average sulphur content of wool is about 3.6 per cent. If one considers 100 grams of a wool fabric dyed with 1 per cent of an azo-sulphite-forming dye such as Crystal Scarlet, then the amount of sulphur dioxide required for its complete conversion into azo-sulphite is equivalent to about 0.064 grams of sulphur. This suggests that less than 2 per cent of the total average sulphur content of wool is required for oxidation to sulphur dioxide under the influence of light such that the whole of the dye present may be completely converted into its less stable azo-sulphite.

From further consideration of the curves in Fig. 2 certain important facts can be deduced as regards the conditions most favorable to the light-fading of two classes of dyes—those which are completely decomposed by bisulphites, and those which form azo-sulphites from which the parent dye can be regenerated. Those dyes which are completely decomposed, for example, Fast Acid Blue RH, are more readily decomposed when the ratio SO_2 /NaOH is less than 1.0. In contrast, the second class of dye is affected more rapidly when the ratio SO_2 /NaOH is greater than 1.0. Thus, initially alkaline fabric dyed with a non-azo-sulphite-forming dye would be expected to fade more slowly than a similarly colored fabric initially slightly acid; the rapid fading of the dye on the first alkaline fabric would not definitely commence until the acid formed by oxidation of the sulphur was sufficient to neutral the initial alkalinity. But the reverse behavior would be shown by a fabric dyed with an azo-sulphite-forming dye since this fades more rapidly under the more alkaline conditions. King actually showed this reasoning to be correct by exposures of acid and alkaline wool dyed with Acid Fast Blue RH and Coomassie Navy Blue and Crystal Scarlet.

All the above facts appear in harmony with the experience of dyers that most dyes lacking fastness to stoving show a poor fastness to light.

Finally a study of the azo-sulphites has been the means for improving processes for bleaching wool and also for stripping dyed wool. The peculiar conditions affecting attending their formation suggested to King (J. Soc. Dyers and Col., 1930, 46, 225) that the bleaching action of a bisulphite solution might be particularly effective if the bisulphite had a composition similar to that most effective in azo-sulphite formation. This proved to be the case and it is now found that very satisfactory bleaching of raw wool can be carried out by using a solution of sodium bisulphite rendered slightly alkaline by addition of a phosphate, carbonate, or alkali hydroxide or borate until its pH=6.8 or such that the ratio SO_2 /NaOH $=1.25-1.35$, corresponding to the compound $2NaHSO_3$. Na_2SO_3. The same solution is very effective in the stripping of wool dyed with those colors capable of forming azo-sulphites. This process is protected and described in E.P. 332,389.

In reflecting on the various facts described above relating to the action of sodium bisulphite on azo dyes and also to the bleaching of wool, one cannot help feeling that the specially high reactivity of the compound $2NaHSO_3$. Na_2SO_3 is of special significance. It would seem that an investigation of the properties of bisulphites under various conditions of alkalinity or acidity would reveal facts of value which might have particular application in the treatment of textile materials.

Returns From World Trip

After a seven month absence Paul Mayfield, representative of the Cellulose Products Department, Hercules Powder Company, has returned to Wilmington following a world-girdling trip, the main object of which was to look after Hercules interests in New Zealand and Australia.

Mr. Mayfield represented the naval stores and cellulose products departments in the interests of Hercules export business in the Antipodes. He reports that Australia is suffering a business depression similar to that in this country, but that the western continent holds wide possibilities.

He returned by way of Ceylon and Bombay and flew from Marseilles to Paris, thence to London. He also visited Hercules' distributors in Holland and Germany. During recent years an increasingly larger proportion of business has been done by Hercules Powder Company in foreign lands.

The Carbic Color & Chemical Co., Inc., have distributed a pamphlet illustrating Indigosol Violet ABBF, a new water soluble vat dyestuff which is said to yield shades of good to very good fastness to light, very good fastness to washing and chlorine, and of good fastness to hot pressing on cotton, rayon, etc.

The leveling properties of this dyestuff are claimed to be excellent, therefore making it particularly useful for the production of pale shades on mercerized piece goods, both as a self-shade and in combination. Sol.-32.

Technical Notes from Foreign Sources

Reserves Upon Silk

German Patent No. 448,847—*I. G. Farben-Ind. A.-G.* (11, VIII, 1927)—An addition to G. P. No. 432,111 (of 20, VI, 1923), in which certain thio-derivatives of phenol are used to protect wool, partly or wholly, from taking up of dyestuffs which are applied in acid or neutral bath. This present patent extends the principle to silk, especially half-silks or fabrics of natural and artificial silks mixed. By use of suitable dyestuffs, the silk element can be kept a pure white. The silk may be weighted or not, and the thio-derivatives can be printed on, or in suitable cases merely added to the bath.

Swelling of Cellulose and Its Derivatives

J. R. Katz — Cellulose-Chemie 11, 17 (1930).—The paper gives a summary of the progress in the study of cellulose problems during the past twenty years; of the phenomena of swelling in general, and of that of cellulose and its derivatives in particular. Attention is called to the conclusions drawn from application of the laws of thermodynamics to the process and the results of swelling; e.g., the relation between "swelling-pressure" and the vapor-pressure of the swelling-agent, and others. K. points out further, and employs examples and figures to prove his statements, that there are fundamental analogies existent between the quantitative laws of swelling in water and the laws which hold good for ideal, aqueous, concentrated solutions, e.g., of phosphoric or sulphuric acid, in water. The relation existing between vapor-tension of the swelling-agent, heat of swelling, and volume-contraction on the one side, and degree of swelling on the other, shows up again quite similarly in case of mixtures, if the same values are considered as functions of the water-content. The same holds good for the swelling of cellulose esters in organic liquids. K.'s conclusion is, of course, that swelled bodies and mixtures should be studied always from the same viewpoint.

The author speaks specifically of the use of Roentgen rays in the study of this topic. He points out that by this method it can be established absolutely whether the swelling is endomicellular or intermicellular in nature. He regards highly the value of Roentgenographic study in this field.

Survey of the Most Recent Developments in Color Theory, Etc.

Dr. A. Klughardt—Seide 35, 281 (1930).—A rather long, but very interesting and valuable paper, which unfortunately cannot be adequately summarized. It is illustrated by several charts and one illustration.

Indigoid Vat Dyestuffs

German Patent No. 438,841—*I. G. Farben-Ind. A.-G.* (29, XII, 1926).—The dyestuffs of the indigo group react with ketones, as acetone or acetophenone, in the presence of alkalis, to form products very soluble in acetone or aqueous alkalis, and reasonably stable. In isolating the products, neutralization of the alkali may be necessary. The new products vat very easily.

A New Artificial Fiber

German Patent No. 432,180—*Dr. E. Burkhard, Dr. W. Dehn, and Dr. H. Rathsburg* (28, VII, 1926).—Proteid matter, such as casein or corn meal, is treated with nitric acid, halogens, or substances which liberate halogen (the material is gently oxidized), and the product gotten into solution in an alkaline medium, such as ammonia water, caustic alkali, carbonates, or sulphides; and this solution is spun in a spinning bath as usual. The spinning bath is of acid nature. By correct choice of concentration, etc., filaments, bands, or sheets of the new material may be produced. The patent covers such materials as keratine, casein, albumen, or other such albuminoid material. The products are of silky luster, fair tensile strength, and waterproof.

Manufacture of Schaeffer Salt

Dr. Karl Wend — Zeitsch. f. Farben-Ind. 20, 272 (1929).—An exhaustive and detailed description, for large-scale work.

Cellulose Esters, Artificial Fibers, Etc.

German Patent No. 434,224—*Courtaulds Ltd., Clement, and Riviere* (22, X, 1924—*priority in Great Britain from* 5, I, 1924).—A cellulose ester is dissolved in a volatile solvent, as acetone, with addition, if desired, of other agents, as triphenyl phosphate, and then spun into a bath of a saponifiable oil, either vegetable or animal, such as castor oil. The ester is thus precipitated rapidly in a homogeneous and transparent form, and can be freed from the oil in any suitable way desired, as by washing or cleansing in petroleum ether. Sesame oil is also mentioned as an oil suitable for the purpose. The solution may also, e.g., be poured upon flat, polished metal sheets, and these, with the coating, immersed in the bath of oil for the proper time (about ½ hour), the oil being then removed from the cellulose acetate sheet by draining and washing in petroleum ether. The films so produced are very clear, tough, and flexible; the filaments are very soft and lustrous.

1931 Spring Woolens

Fifty shades are to appear on the 1931 Spring Woolen Card, which will soon be issued by the Textile Color Card Association according to an announcement made today by Margaret Hayden Rorke, Managing Director. Advance swatches have just been sent out to members in the woolen industry.

Blues are regarded as outstanding, being shown in a clear navy and in several new shades slightly lighter than navy. French blues of medium tonality are also included, as well as those with a violet cast.

An important place is accorded beiges, especially the new sandy tones. There is also a beige range of mauvish cast and a gamme of slightly yellowish beiges shading into a warm light brown.

Greens retain their prominence, being represented in both yellowish and bluish types, as well as a new almond tone. Two clear greys, a medium and lighter shade, are cited as high-fashion notes.

A new interpretation of rose is reflected in a range of strawberry and raspberry tones. Reds of bluish cast are also shown.

A group of animated sports hues includes shades of turquoise, sky blue, straw and butter yellows, jade, bud green, and a light yellowish red. A number of these sports shades will be particularly important as accent notes with white.

In the interests of color correlation, twenty-seven shades to be shown on the 1931 Spring Woolen Card are also portrayed on the Silk Card and have the same names. In this co-ordinated group are colors chosen for the coming Spring and Southern resort seasons

CHEMIST-EXECUTIVE AVAILABLE

Textile Chemist with twenty-two years' practical experience. Graduate Lowell Textile Institute. Four years instructor in Chemistry and Dyeing. Three years theoretical and practical experience in Peroxide Bleaching. Fifteen years in charge of chemical work in large textile plant. Experienced in purchase of dyes and chemicals. Excellent analyst, and one who can interpret results.

Would consider position as technical advisor to chemical or dyestuff executive. Address: Classified Box No. 638, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

POSITION WANTED

Dyer, Worsted and Woolen—technically trained man wishes to make a change about January 1st. Progressive and excellent color matcher. Has successfully managed several dye houses for a number of years, and can furnish excellent references confirming the above statement. Address Classified Box No. 644, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

The rate for "Position Wanted" advertisements in this column is 2 cents a word—with a minimum of 50 cents per insertion. For all other types of advertisements—i.e., help wanted, machinery or supplies for sale—the rate is $5.00 per column inch or less per insertion.

PRIVATE SECRETARY—ASSISTANT TO EXECUTIVE AVAILABLE

Private secretary, assistant to executive, with several years' experience with a foreign and domestic dyestuff and chemical manufacturing concern, desires a position in the above capacity. Address: Classified Box No. 651, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

POSITION WANTED

Chemist—seven years' experience, manufacturing and research on azo dyes and sulphonated oils. Reasonable salary. Good references. Address: Classified Box No. 648, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

POSITION WANTED

Colorist, thirty, married, twelve years' experience in laboratory of dyestuff manufacturer, doing standardizing, shade matching, and demonstrating; desires position in dyestuff manufacturer's laboratory or in a mill. Address Classified Box No. 645, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

POSITION WANTED

Salesman, 12 years' selling experience dyestuffs, oils, finishes and specialties, 32 years of age, married. Familiar with Pennsylvania territory. Address: Classified Box No. 652, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

POSITION WANTED

Cotton dyer, 17 years' experience, 2 years in laboratory, 5 years second-hand, 12 years overseer in best mills. Thoroughly experienced on vat, sulphur, fast to light dyes on long and short chains, skeins and raw stock; on cotton or rayon and all novelty yarns. Fully understand care and upkeep of dyehouse. Am able to take care of unusual problems and conditions that may arise. American, married, 35 years old, steady, sober, industrious, will go anywhere, as dyer or demonstrator. References. Address: Classified Box No. 653, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.